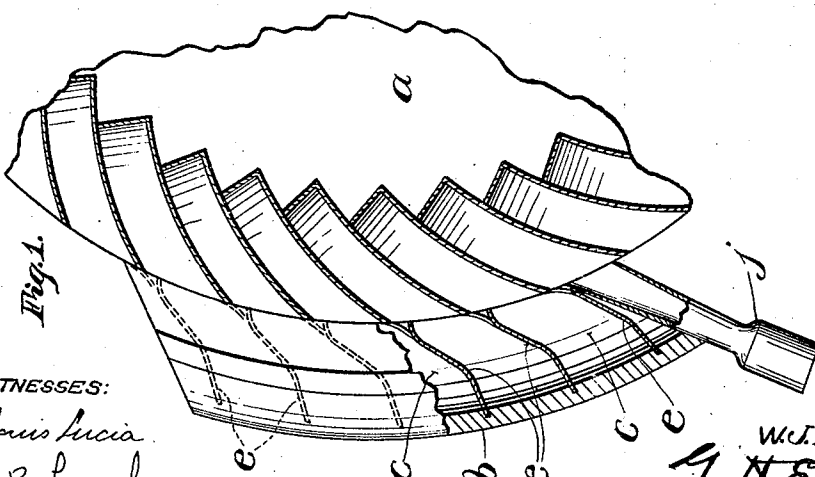
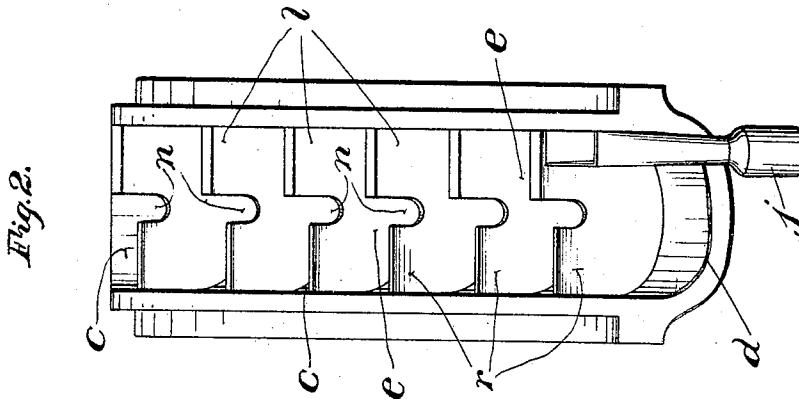
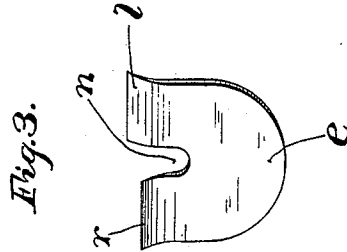
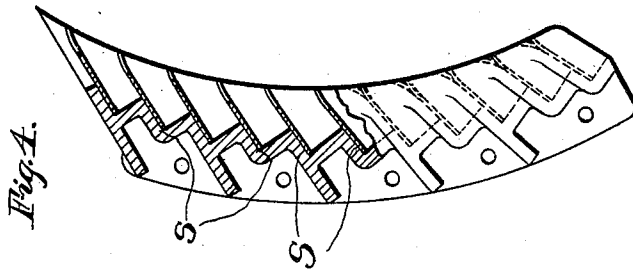


W. J. A. LONDON.
ELASTIC FLUID TURBINE.
APPLICATION FILED AUG. 2, 1910.

992,433.

Patented May 16, 1911.



WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIAM J. A. LONDON, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE TERRY STEAM TURBINE COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF CONNECTICUT.

ELASTIC-FLUID TURBINE.

992,433.

Specification of Letters Patent.

Patented May 16, 1911.

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To all whom it may concern:

Be it known that I, WILLIAM J. A. LONDON, a citizen of the United States, and a resident of Hartford, in the county of Hartford, State of Connecticut, have invented certain new and useful Improvements in Elastic-Fluid Turbines, of which the following is a specification.

My invention relates particularly to turbines of the type described in U. S. Patent 741,385, Oct. 13, 1903, to E. C. Terry, in which a rotor is provided with a series of buckets semicylindrical in form with their mouths at the periphery of the rotor, and a reversing unit, comprising one or more semicylindrical reversing chambers with their mouths confronting the mouths of the buckets, so that when considering a single bucket and a reversing chamber opposed to it they open mouth to mouth and the two form substantially a circular chamber with a short straight portion on two sides.

While I have illustrated and hereinafter describe a reversing unit having a plural number of reversing chambers, and refer to the member which separates these reversing chambers from one another as a division plate, it is apparent that under certain conditions a single reversing chamber is sufficient, and in such case that wall of the reversing chamber which determines the direction of the flow of the actuating fluid is termed the guide plate.

My invention relates particularly to a novel construction of the reversing chambers by means of which the "lead" and "return" faces of a division or guide plate, as the case may be, can be fixed at the proper angle to correctly deliver the actuating fluid to and receive it from the buckets of the rotor.

It is of course apparent that the actuating fluid travels in a circular path from bucket to reversing chamber and back to bucket again, then to the next reversing chamber, back to the bucket, and so on, and by "lead face" I mean that part of the front edge of the division or guide plate which delivers the actuating fluid to the bucket, and by "return face" I mean that part of the front edge of the division or guide plate which receives the actuating fluid from the bucket.

Referring to the drawings: Figure 1 is a side view of a part of a rotor and a revers-

ing unit, the latter being shown partly in section. Fig. 2 is a front view of the reversing unit. Fig. 3 is a perspective view of one of the division or guide plates. Fig. 4 is a view of one modification.

Referring to the drawings *a* denotes the rotor, which of course is carried by a shaft mounted in suitable bearings within a case, and *b* is a reversing unit arranged in operative relation to the rotor, being suitably supported within the case. I have not illustrated in the drawings the complete turbine equipment as that forms no part of my invention.

c c c denote the reversing chambers of the reversing unit *b* having curved rear walls *d* to guide the actuating fluid, and division plates *e e e* separating these reversing chambers from one another. Heretofore these reversing units have been formed in sections from cast metal and secured together, but from a commercial standpoint it has been impractical to give to the "lead" faces *l l l* and the "return" faces *r r r* of the several division plates their proper and individual inclination.

By my invention I form the division plates separately from the other parts of the reversing unit, provide means for inserting and securely fastening them in place, but leaving them free at the sides near the mouth of the chambers in order that when necessary or advisable the faces of the division plates can be given the proper or any desired inclination by the use of a suitable setting tool to conform to the requirements of any given case or condition.

My invention is not concerned with the form in which the reversing unit or the reversing chambers are made or arranged, but it consists primarily in forming the division plates of a material, such as sheet metal, which can be bent and shaped as desired and independently of one another.

It being understood that the actuating fluid enters the reversing chamber at one side and leaves at the other, it is apparent that the angle of inclination of the delivery face is different from the angle of inclination of the return face of the division or guide plate. Also it is desirable to provide an exit for dead steam which will collect at about the center of the reversing chamber.

By cutting a notch *n* of substantial width and depth in the front edge of each division

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or guide plate I separate the delivery and return faces sufficiently so that each can be given its proper and individual inclination without affecting the other, and I also provide an escape passage through which the dead steam can pass out to the exhaust chamber. In a case where a reversing unit comprises several reversing chambers these escape passages are arranged in alinement so that the dead steam can pass from the primary chamber through the succeeding lower pressure chambers until it reaches the exhaust.

A nozzle for supplying actuating fluid to the turbine is indicated at *j*.

It is of course apparent that my invention is not confined to reversing units having any number of reversing chambers, or to the precise construction illustrated in the drawings, which are intended merely to show one embodiment of the invention.

It will also be apparent by reference to the aforementioned Terry patent that buckets can be arranged at the sides of the rotor as well as in the periphery, and that my invention can be utilized in connection with such a structure.

In Fig. 4 I have illustrated one other way in which a reversing unit can be made embodying my invention. The frame is formed in one complete casting with a series of flat shoulders *s* arranged in step formation, on which the rear part of the division plates are located and secured.

I claim:—

1. The combination in a fluid actuated turbine with a rotor having buckets of semicylindrical form, of a reversing chamber of semicylindrical form arranged in operative relation to said rotor, said reversing chamber comprising a frame, a sheet metal guide plate forming one wall of said chamber supported in said frame, the front edge of said guide plate being centrally notched as and for the purposes specified.

2. In a fluid actuated turbine the combination

with a rotor having buckets of semicylindrical shape, of a reversing unit comprising a frame having two or more reversing chambers of semicylindrical shape formed therein, division plates between said chambers supported at their rear edges and part way along their side edges in said frame, the forward part of said division plates being free from support along the edges, whereby the "lead" and "return" faces of said plate can be bent at an angle to the main body of said plate for the purposes specified.

3. In a fluid actuated turbine the combination with a rotor having buckets of semicylindrical shape, of a reversing unit arranged in operative relation to said rotor, said reversing unit comprising a frame, semicylindrical reversing chambers formed therein and division plates between said reversing chambers and supported in said frame, said division plates being formed up from sheet metal with a notch of substantial depth and breadth centrally in the front edge thereof, the side edges of said division plates near the front being free from support whereby the "lead" and "return" faces can be bent independently of each other and out of the plane of the main part of said plates.

4. In a fluid actuated turbine the combination with a rotor having buckets of semicylindrical shape, of a reversing unit comprising a frame, semicylindrical chambers formed therein and division plates supported in said frame and supporting said reversing chambers from one another, and exhaust passages formed in said plates and establishing communication from one reversing chamber to adjacent reversing chambers for the purposes specified.

WILLIAM J. A. LONDON.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."