

Aug. 18, 1931.

M. SEDLMEIR

1,819,485

TURBINE NOZZLE

Filed Sept. 4, 1926

Fig. 1.

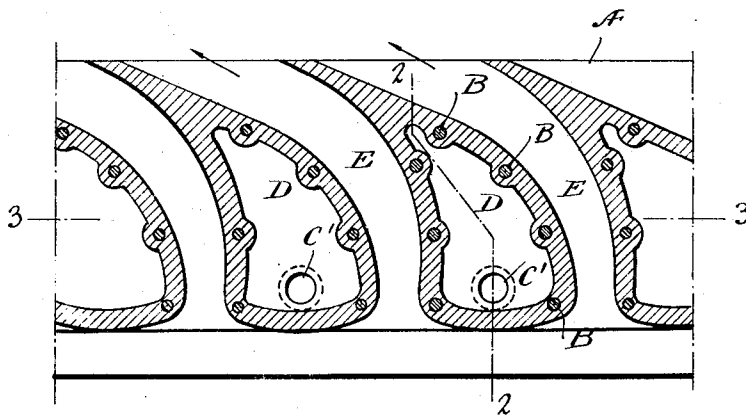


Fig. 2.

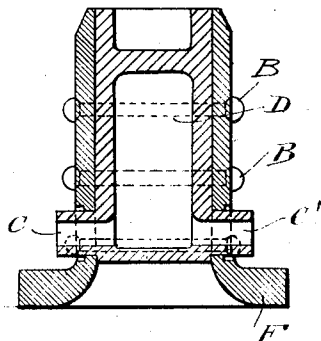
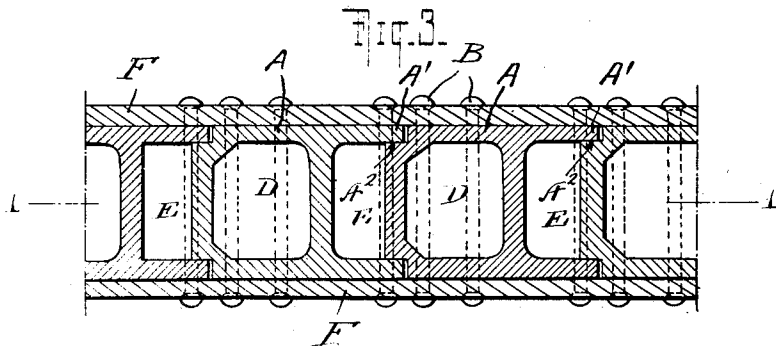


Fig. 3.



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TURBINE NOZZLE

Application filed September 4, 1926. Serial No. 133,568.

My invention relates to turbines and particularly to nozzles by which the driving or motive fluid is directed against the turbine blades. Such nozzles have hitherto been made substantially straight with only their ends deflected laterally. This straight construction of the nozzles is objectionable for several reasons. First of all, the material is left relatively thin, particularly adjacent to the nozzle outlets, and it thus becomes very difficult to place the rivets by which the adjacent nozzles are connected with each other, and it is especially almost impossible to apply rivets in the neighborhood of the nozzle outlets. Another difficulty is that there are certain limitations as to the angle at which the motive fluid may issue from the nozzle, and particularly it is practically impossible to have the fluid jets issue at a very flat or slight angle. Again, cooling of the nozzle and especially its outlet portion, cannot be accomplished effectively. My present invention provides a nozzle in which the main direction of the flow is not along a straight line but along a curved path, and this enables me to so construct the nozzle that the rivets may be applied quite close to the nozzle outlet, thereby obtaining a structure of very great strength. Furthermore, the fluid may be caused to issue at a very flat angle. In addition thereto, the cooling of the nozzle may be carried out efficiently even in the neighborhood of the nozzle outlet. These and other advantages are secured by my invention, a typical embodiment of which is illustrated by the accompanying drawings in which Fig. 1 is a partial section through a turbine nozzle ring embodying my invention, said section being taken along a cylinder centered on the rotor axis and substantially along the line 1—1 of Fig. 3, and Figs. 2 and 3 are partial sections of lines 2—2, 3—3 respectively of Fig. 1.

The improved nozzle ring construction consists of a plurality of cylinder elements A each of which has a fork A' at one end projecting from the body thereof to embrace a projection A² at the other end of the adjacent member or element. Rivets B may be passed through contacting portions of the

forks A' and projections A² and, as shown best in Fig. 1, some of these rivets may be located quite close to the outlet end of the nozzle. Adjacent to each of the portions or projections A² are located connecting projections C, C' through which a cooling fluid of any desired character may reach a cooling chamber D located adjacent to the nozzle proper, the nozzle channel E being formed between the members of the fork A' and the projection A². That will be understood best by reference to Fig. 3. F indicates a carrier body or ring on which the nozzles are mounted.

The construction illustrated may be made of individual members made of cast steel and they may be assembled without any permanent connection, the riveting taking place subsequently. It will be seen readily that the angle at which the driving fluid issues from the nozzles may be made very flat if desirable, and yet the rivets may be located quite close to the nozzle outlets and the cooling chambers D may be extended quite close to the nozzle outlets so as to secure an efficient cooling action. If the cooling medium employed is air, the action is improved to such an extent that a much smaller amount of air need be employed when the air is injected or forced through under pressure, or I may even dispense with the injection of air and rely simply on the entrance of atmospheric air into the cooling chamber. Another advantage of the new construction is that it permits the nozzle surfaces to be given a very high polish so as to reduce their resistance to the flow of the motive agent and thus minimize friction losses. The new nozzle is also much more durable than those employed hitherto, and will not warp during cooling.

Various changes in the specific forms shown and described may be made within the scope of the claims without departing from the spirit of my invention.

I claim:

1. A turbine nozzle ring comprising a plurality of connected elements each of which is composed of a body member having a pair of parallel fork members projecting from one end thereof, said fork members being spaced

in a radial direction with respect to the axis of the nozzle ring, said body member at its opposite end being provided with notches into which the fork members of the adjoining element fit, whereby a nozzle channel defined by
5 said body member, said fork members and the rear end of the adjoining element, is formed, said body member being hollow, and conduits for conducting a cooling medium to
10 and withdrawing the same from the interior of said member.

2. A turbine nozzle ring comprising a plurality of connected elements each of which is composed of a body member having a pair
15 of parallel fork members projecting from one end thereof, said fork members being spaced in a radial direction with respect to the axis of the nozzle ring, said body member at its opposite end being provided with notches
20 into which the fork members of the adjoining element fit, whereby a nozzle channel defined by said body member, said fork members and the rear end of the adjoining element, is formed, said element being hollow at least
25 in part to provide a cooling space adapted to have a cooling medium circulating there-through.

3. A turbine nozzle ring comprising a plurality of elements each of which is composed
30 of a body member having a pair of parallel fork members projecting from one end thereof, said fork members being spaced in a radial direction with respect to the axis of the nozzle ring, said body member at its opposite end
35 being provided with notches into which the fork members of the adjoining element fit, whereby a nozzle channel defined by said body member, said fork members and the rear end of the adjoining element, is formed, said
40 body member being hollow, and conduits for conducting a cooling medium to and withdrawing the same from the interior of said member, said elements being riveted to each other through the ends of the fork members
45 and the rear end of the adjoining element interfitting therewith.

In testimony whereof I have hereunto set my hand.

MICHAEL SEDLMEIR.

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