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BLADED GAS TURBINE ROTOR MADE OF CERAMIC MATERIALS

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Fig. 1

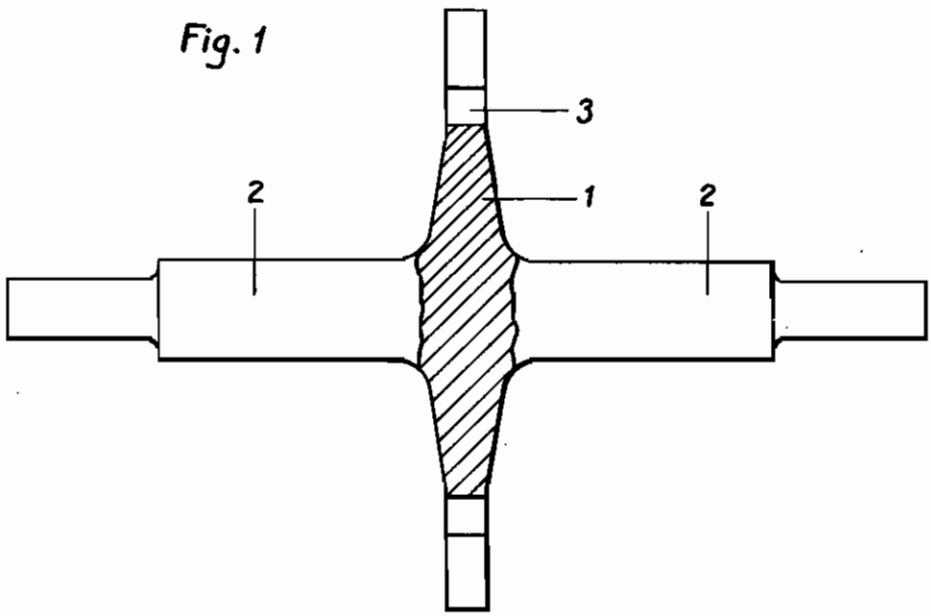
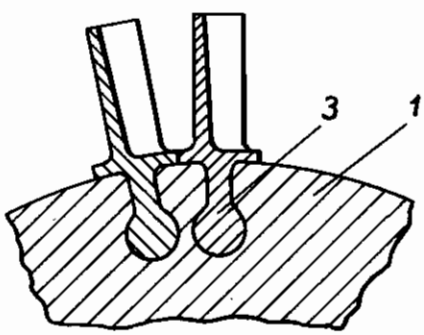


Fig. 2



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BLADED GAS TURBINE ROTOR MADE OF CERAMIC MATERIALS

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This invention relates to a bladed gas turbine rotor made of ceramic materials.

The successful operation of a gas turbine requires high gas temperatures, and even the best steels of high creep strength fail to satisfy at temperatures exceeding, say, 700° C. It has therefore been proposed to make the parts exposed to high gas temperatures from ceramic materials possessing sufficient strength at high temperatures, but such an arrangement involves numerous difficulties. It is possible of course to make the rotor integral with the blades in a reaction turbine having few winglike blades, but if many heavily curved blades are required in a different type of turbine the application of this method will cause a lot of trouble. In particular, it is hardly possible subsequently to finish the blades of such a wheel. It has further been suggested separately to produce the rotor and the blades fitted with a T-head or a "Laval" base and then to insert the latter in the rotor. A T-head, however, subjects the portion of the rotor embracing the base of the blade to considerable bending stresses, which should be avoided in ceramic materials, and the fastening of the closing piece is, moreover, quite difficult. Blades having a "Laval" base require, on the other hand, insertion under tension, i. e. a close or force fit, impossible in case of ceramic materials.

According to the invention these difficulties are overcome by separately manufacturing the blades having a "Laval" or similar base from ceramic materials and choosing the permissible variations of the base and of the corresponding grooves in the rotor so that the blades are inserted with suction in the grooves of the rotor and are burned thereto with the aid of a glaze which is stable up to temperatures slightly exceeding the gas temperature in the turbine.

One form of the invention is illustrated by way of example in the accompanying drawing, in which

Figure 1 is a partial longitudinal section of a rotor according to the invention, and

Fig. 2 is a partial cross section thereof.

In a rotor 1 having shaft ends 2 finished blades 3 are inserted and secured therein by means of a glaze burnt upon the fully assembled wheel.

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