Nov. 9, 1948. C. R. SODERBERG ET AL 2,453,547

TURBINE CONSTRUCTION

Filed Jan. 28, 1944 3 Sheets-Sheet 1

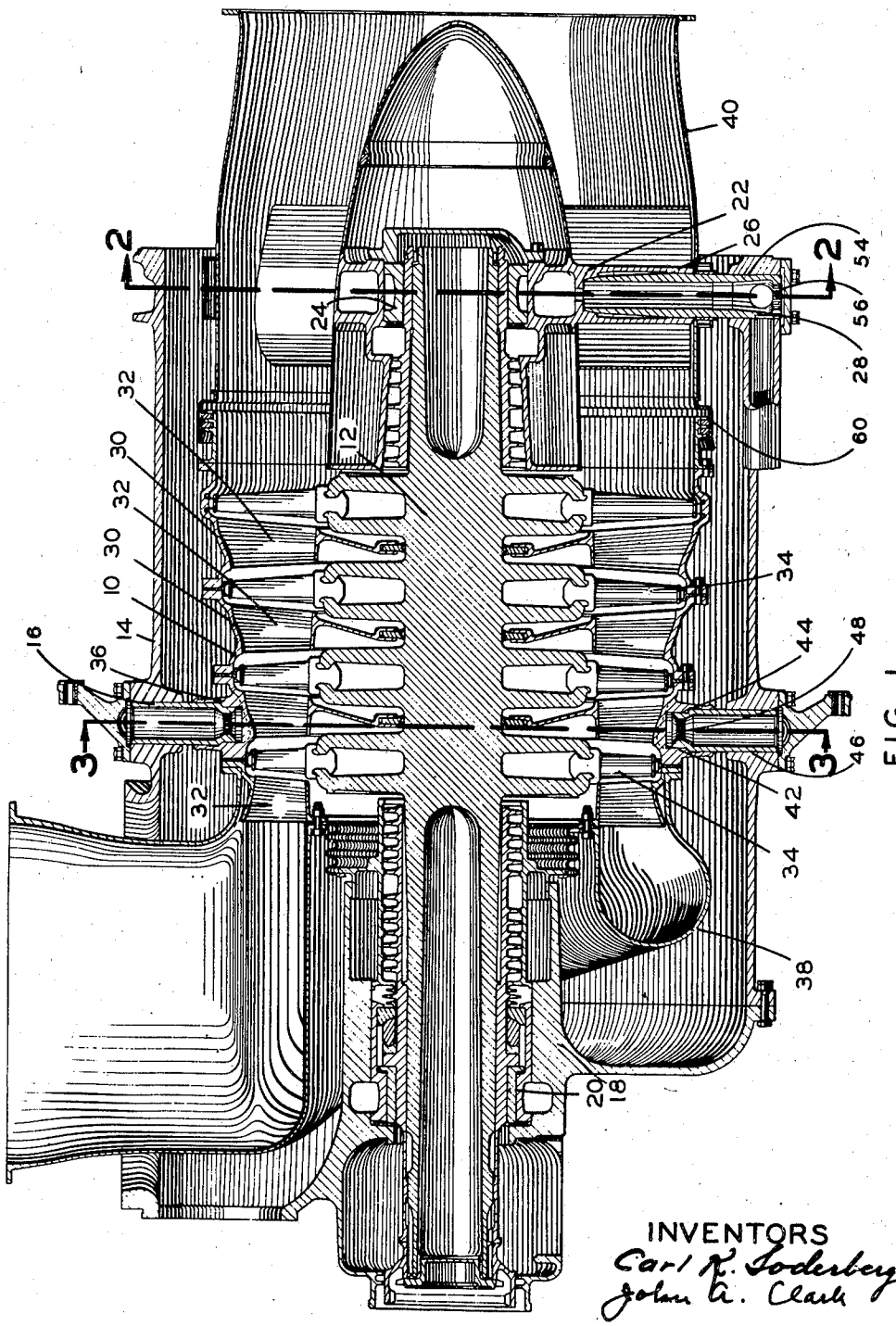


FIG. 1

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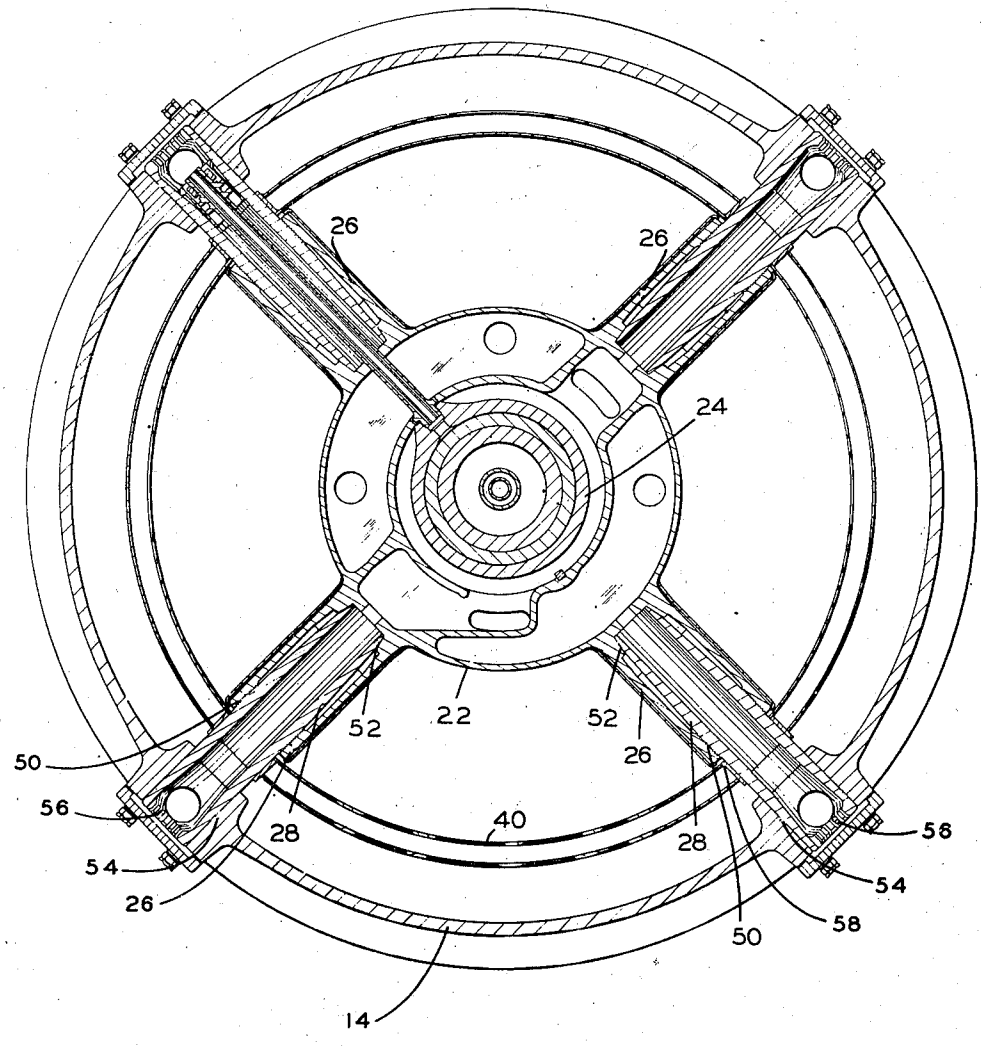


FIG. 2

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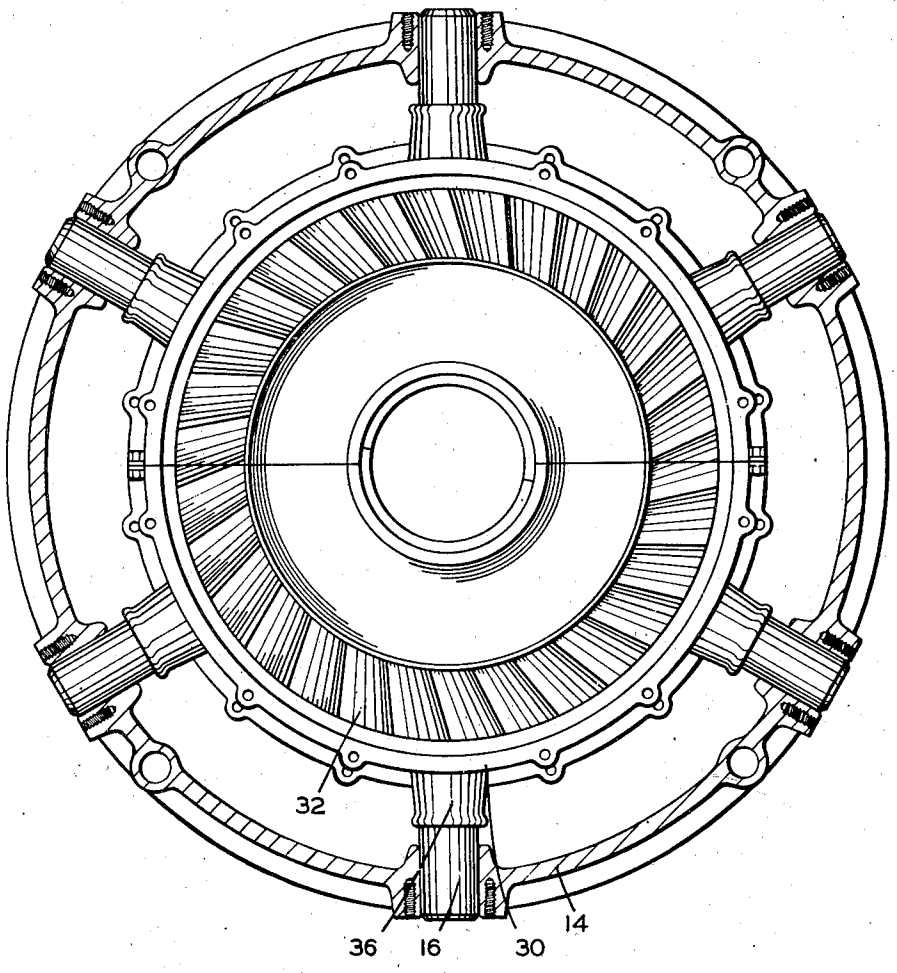


FIG. 3

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TURBINE CONSTRUCTION

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Application January 28, 1944, Serial No. 520,067

5 Claims. (Cl. 253—39)

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The copending application of Cronstedt, Serial No. 486,619, filed May 11, 1943, now Patent Number 2,421,833 of June 10, 1947, shows a turbine which includes a casing and a rotor, both supported by a housing. The path for power gas is within the casing and out of contact with the housing so that the housing remains cool. The rear bearing around which the power gas passes is supported within the housing by radial pins extending into legs projecting from the bearing mounting and the casing is supported by similar pins. These pins, which allow for radial expansion of casing and bearing mounting are fixed in the housing and slide in either casing or mounting. The high operating temperature to which the casing and mounting are subjected during operation of the turbine may cause galling or seizing of the pins. An object of this invention is to overcome this disadvantage by having the pins slidable in the relatively cool housing.

In this type of turbine, the housing may be kept cool by circulating air between the casing and housing and around the exhaust duct which surrounds the bearing mounting. A feature of this invention is an arrangement by which the supporting pins extend through this cool space so that the parts of the pins which are slidable in the housing remain cool.

Other objects and advantages will be apparent from the specifications and claims and from the accompanying drawings which illustrate an embodiment of the invention.

Fig. 1 is a sectional view through the turbine.

Fig. 2 is a sectional view on line 2—2 of Fig. 1.

Fig. 3 is a sectional view on line 3—3 of Fig. 1.

The turbine includes a casing 10 and rotor 12 both supported in a housing 14. The casing is supported by a number of radially extending pins 16, all in substantially the same plane. The casing is free to expand lengthwise within the housing since these pins are the sole support for the casing.

Housing 14 has a head 18 which forms part of the housing and supports a hearing sleeve 20 for the front end of the turbine rotor. At the other end of the housing is a bearing mounting 22 having a bearing 24 for the turbine rotor. The mounting 22 has a number of radially extending legs 26 engaging with radially extending supporting pins 28.

The casing is built up of several rings 30, each of which has a single row of vanes 32. These rows of vanes alternate with cooperating rows of blades 34 on the rotor. One ring 30 has a number of bosses 36 which receive the supporting pins 16.

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An inlet duct 38 together with casing 10 and an exhaust duct 40 around the rear mounting 22 form a continuous path for the power gas, which is within and spaced from housing 14. Cooling fluid may pass through the space between the housing and the parts of the turbine defining the gas path to assist in cooling the housing. Both sets of pins 16 and 28 extend through the space between housing 4 and the parts of the turbine defining the gas path so that cooling fluid will pass around parts of each pin to assist in keeping the pins cool.

Each pin 16 supporting casing 10 is threaded at its inner end and engages with cooperating threads 42 in the boss 36. Each pin also has a shoulder 44 cooperating with a shoulder in the boss for accurately locating the pin in the boss. These pins are slidable within bores 46 in housing 14 to permit the casing to expand freely without stressing the housing. Each pin may have a spline 48 by which the pin is screwed into the casing during assembly.

As shown in Fig. 2, each pin 28 supporting the rear bearing mounting is threaded to engage with cooperating threads 50 in the associated leg 26, of the mounting. Each pin 28 also has a tapering inner end 52 fitting in a seat in the leg for additionally supporting and locating the pins. The outer end of each pin 28 is slidable in a bore 54 in housing 14 to permit expansion of the mounting without distorting the housing. A spline 56 in each pin provides for screwing the pin into or out of the leg.

The pins 28, in addition to supporting the rear bearing mounting, may also support exhaust duct 40 within housing 14, since as shown in Figs. 1 and 2 the pins extend through openings 58 in the duct. A slidable connection 60 between the discharge end casing 10 and the duct permits lengthwise expansion of casing or duct independently of the support of these parts by pins 16 and 28.

It is to be understood that the invention is not limited to the specific embodiment herein illustrated and described, but may be used in other ways without departure from its spirit as defined by the following claims.

We claim:

1. A turbine including a housing, a rotor within the housing, a bearing mounting for one end of the rotor, and means for supporting said mounting within the housing including a number of radial pins having a slidable connection with the housing, and being fixed within the mounting.

2. A turbine including a housing, a rotor within the housing, a bearing mounting for one end of

the rotor, and means for supporting said mounting within the housing, including a number of legs, and pins slidable in said housing and engaging said legs.

3. A turbine including a housing, a rotor within the housing, a bearing mounting for one end of the rotor, and means for supporting said mounting within the housing including a number of legs and pins threaded in said legs and slidable in said housing.

4. A turbine including a housing, a casing within the housing and defining a path for power fluid spaced from said housing, a rotor within the housing, a bearing mounting within the housing for said rotor, said mounting being located in the fluid path, said mounting having a number of legs each having a slidable connection with the housing.

5. A turbine including a housing, a casing within the housing and defining a path for power fluid spaced from said housing, a rotor within the housing, a bearing mounting within the housing for said rotor, said mounting being located in the fluid path, said mounting having a number of legs and pins slidable in said housing and engaging said legs for supporting the mounting.

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