United States Patent [19]

Remberg

[11] **3,754,833**

[45] **Aug. 28, 1973**

[54] **DEVICE FOR RADIALLY CENTERING TURBINE HOUSINGS**

[75] Inventor: **Axel Remberg**, Mulheim, Germany

[73] Assignee: **Kraftwerk Union Aktiengesellschaft**, Mulheim, Germany

[22] Filed: **Apr. 17, 1972**

[21] Appl. No.: **244,416**

[30] **Foreign Application Priority Data**

Nov. 5, 1970 Germany ..... P 20 54 465.4

[52] **U.S. Cl.** **415/108**, 415/134, 415/136, 415/142, 415/219

[51] **Int. Cl.** **F01d 25/26**

[58] **Field of Search** 415/108, 134, 136, 415/142, 219

[56] **References Cited**

UNITED STATES PATENTS

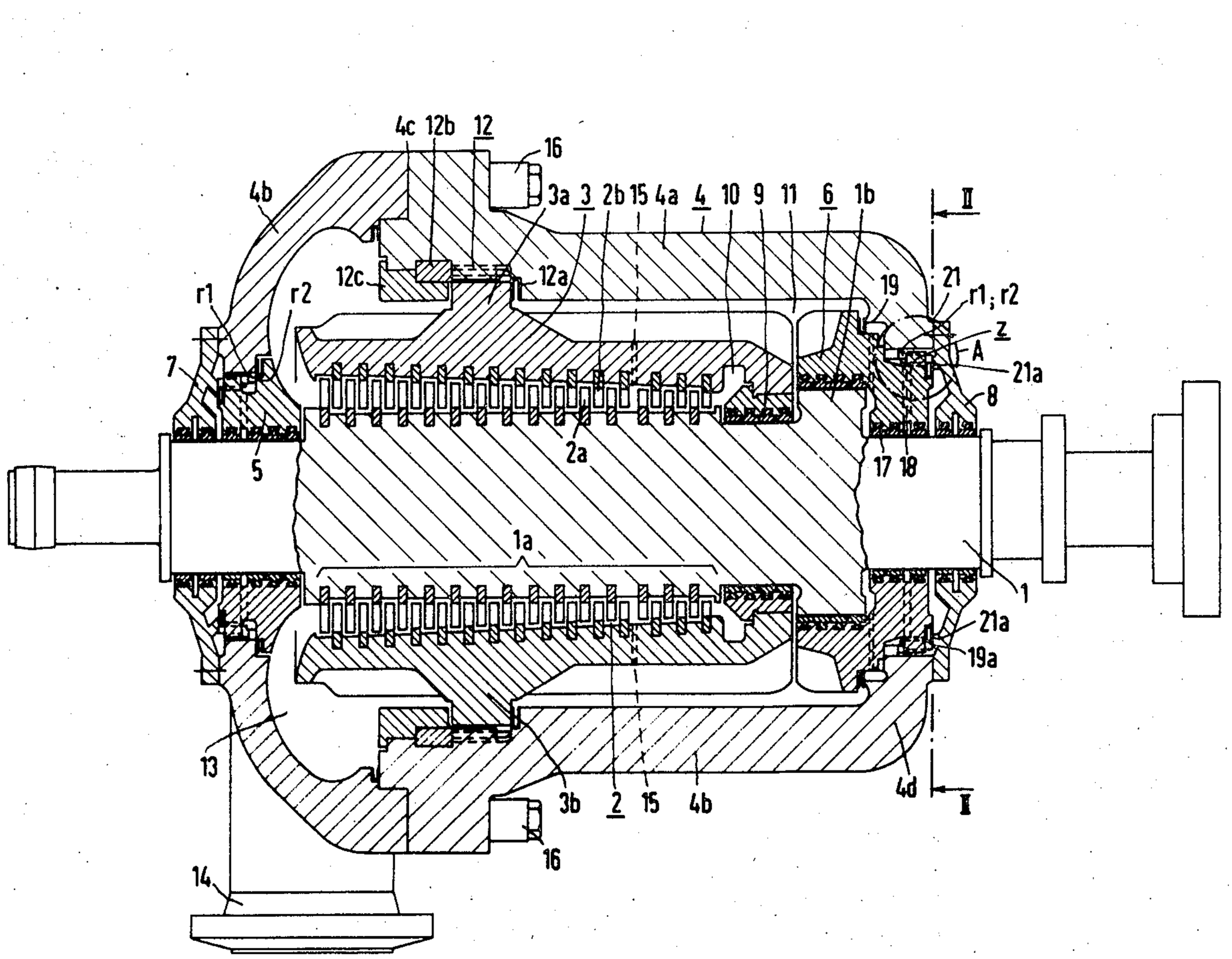
1,067,356	7/1913	Ljungstrom	415/136
3,592,557	7/1971	Haas	415/108
3,628,878	12/1971	Trassei et al	415/108

Primary Examiner—C. J. Husar
Attorney—Herbert L. Lerner et al.

[57] **ABSTRACT**

In order to attain an axially fixed mounting of the inner shell of a turbomachine housing in the vicinity of the bearing and centering locations of a respective, axially-normal plane, a pocket space of a groove widening provided in an axial groove formed in the outer shell of the housing is located, as viewed from the outside, axially behind a respective retaining claw received in the axial groove and is formed by a reduction of the narrower axial groove with respect to the groove widening. Another fitting member in form of a cross bar is insertable into the pocket space, rearwardly engages the retaining claw and abuts axially against housing shoulders located in vicinity of a bottom surface of the pocket space, thereby fixing the inner shell against displacement in one axial direction. The inner shell is formed with annular surfaces abuttable against corresponding annular shoulder-countersurfaces formed on the outer shell, thereby fixing the inner shell against displacement in the other axial direction.

8 Claims, 5 Drawing Figures



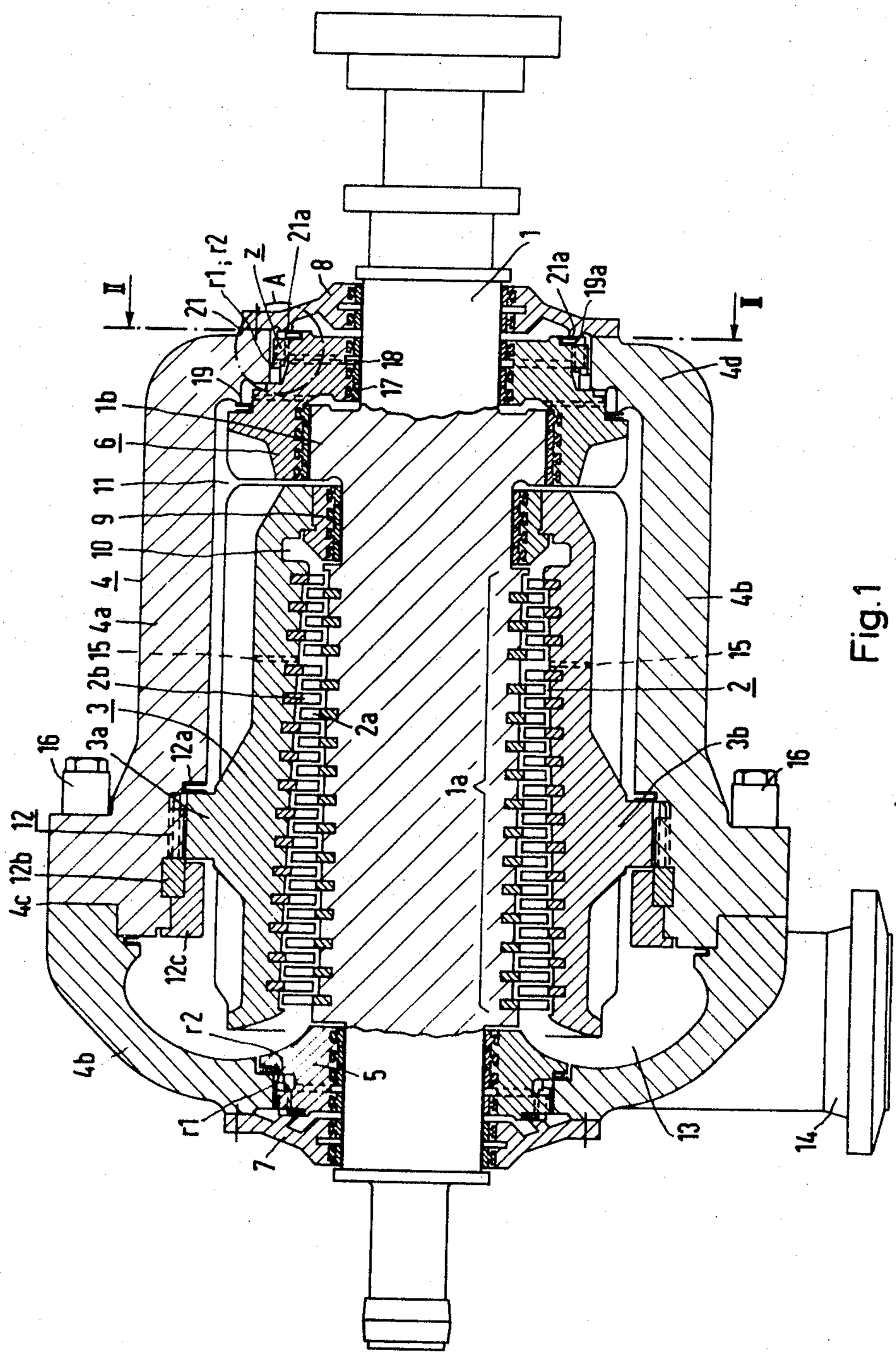

II
I
21
r1; r2
Z
A
21a
8
1
21a
19a
19
17 18
4d
1b
6
11
9
10
4
4a
2b 15
2
4b
3
2b
3a
2a
16
12a
1a
3b
16
12
4c
12b
12c
r2
4b
5
r1
7
13
14

Fig.1

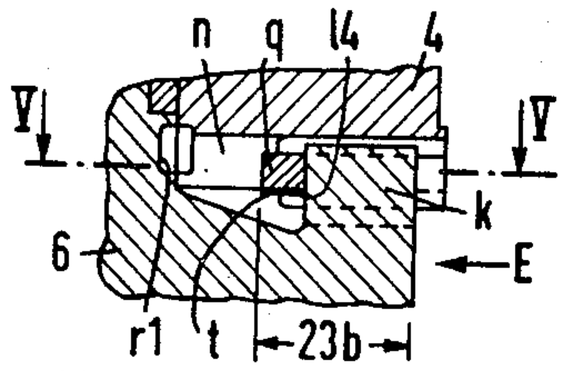


Fig. 3

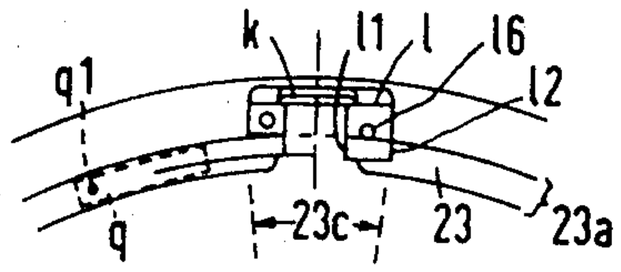


Fig. 4

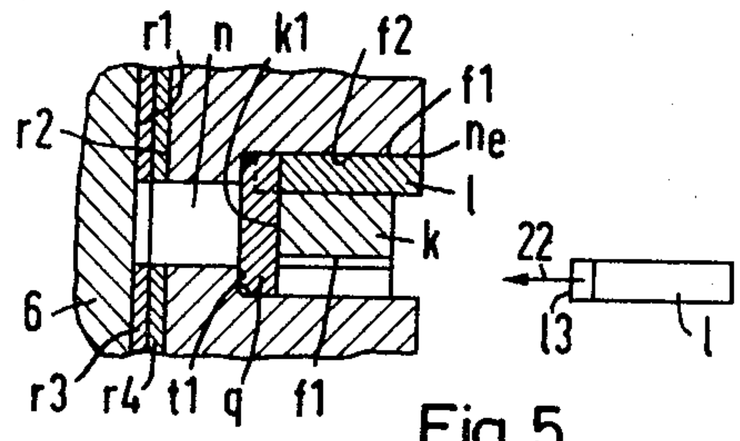


Fig. 5

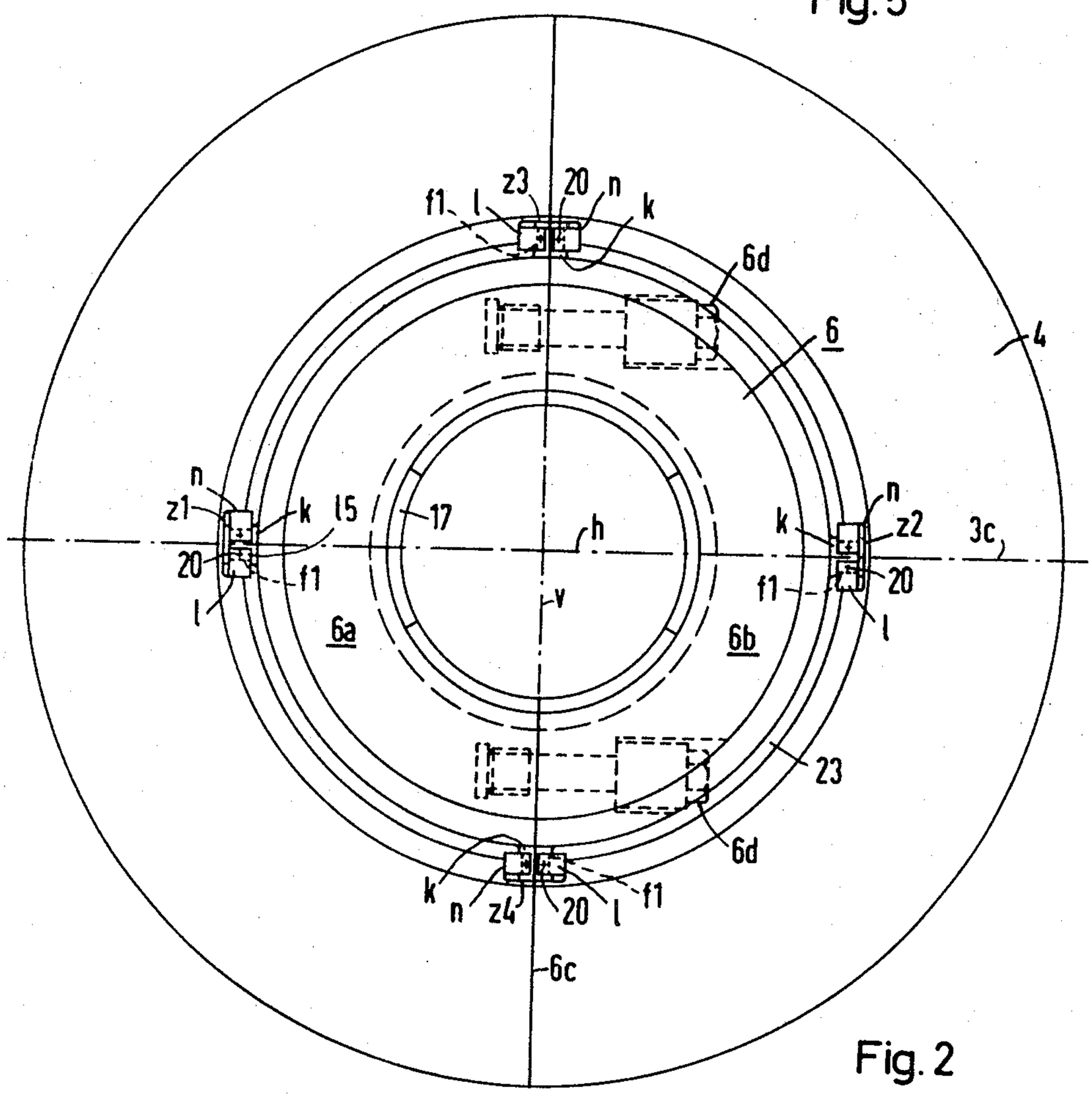


Fig. 2

DEVICE FOR RADIALLY CENTERING TURBINE HOUSINGS

The invention relates to a device for radially-centrally, thermally displaceably mounting and centering inside housing shells relative to outside housing shells in turbomachines and, more particularly steam turbines, having at least three, but preferably four bearing and centering locations disposed in an axially normal plane and symmetrical to the major transverse axes of the turbomachines. The inner shell which is insertable axially into the outer shell, that has a pot-like construction, is provided at the outer periphery thereof in the vicinity of the bearing and centering locations, with radially protruding retaining claws while the outer shell is provided, at respective locations of the inner periphery thereof, with axial grooves which accommodate the retaining claws. The axial grooves are formed, on both longitudinal sides of the retaining claws, with peripherally extending groove widenings located between first, axially extending fitting surfaces of the retaining claws and second axially extending fitting surfaces of the axial grooves and located in spaced relationship to the first surface, fitting members in form of axially insertable longitudinally extending bars being receivable in the groove widenings.

Such a device is basically known from German Published Application DAS 1,018,071. The advantages thereof is its rugged construction and the avoidance of ruptures in the outer housing. The heretofore-known device does not, however, afford axial fixation of the inner shell with respect to the outer shell; this axial fixing, as is well known, is required at one end of the inner shell in order to attain a defined set point or fixed point wherefrom the axial housing-expansions can proceed.

It is accordingly an object of the invention to provide a device of the foregoing type with axial fixing means which are of rugged construction and relatively easy to assemble as well as dismantle.

With the foregoing and other objects in view, there is therefore provided, in accordance with the invention, device for radially-centrally, thermally displaceably mounting and centering an inner shell of a turbomachine housing relative to a pot-shaped outer shell thereof, the inner shell being axially insertable into the outer shell, including at least three bearing and centering locations disposed in an axially normal plane and symmetrical to the major transverse axes of the turbomachine, retaining claws radially extending from the outer periphery of the inner shell in vicinity of the bearing and centering locations, the outer shell being formed at corresponding locations of the inner periphery thereof with axial grooves wherein the retaining claws are receivable, the axial grooves being formed on opposite longitudinally extending sides of the retaining claws, with peripherally extending groove widenings located between first axially extending fitting surfaces of the retaining claws and second axially extending fitting surfaces of the axial grooves and located in spaced relationship to the first surfaces, fitting members in form of axially insertable longitudinally extending bars receivable in the groove widenings, and, to mount the inner shell in the vicinity of the bearing and centering locations of the respective axially normal plane, including a pocket space of the groove widening located, as viewed from the outside, axially behind the respective retaining claws and formed by a reduction of the narrower axial groove with respect to the groove widening,

and another fitting member in form of a crossbar insertable into the pocket space and rearwardly engaging the retaining claw and abutting axially against housing shoulders located in vicinity of a bottom surface of the pocket space, whereby the inner shell is fixed against displacement in one axial direction, the inner shell being formed with annular surfaces abuttable against corresponding annular shoulder-countersurfaces formed on the outer shell whereby the inner shell is fixed against displacement in the other axial direction.

The advantages afforded by the invention of this application lie primarily in the fact that the bearing and centering locations can absorb considerable forces and, nevertheless, permit a very exact and confortable adjustment. The device is of such rugged and stable construction that the shaft sealing casings, for example, can get by with only one axially normal bearing and centering location plane at one of the ends thereof, while the other end thereof can project freely, axially and radially displaceably, into the steam chamber or interior space of the outer housing of the steam turbine. This is effected, in a desirable manner, by the insertion of the outer shell between the annular surfaces of the inner shell and the annular shoulder-countersurfaces. This construction can be further improved, as a result of the use of slide rings that are disposed, on the one hand, in annular grooves of the inner shell and, on the other hand, of the outer shell. The slide rings can be made of a stell possessing particularly advantageous sliding properties and having an especially precise construction.

In accordance with another feature of the invention, the fitting surfaces of the retaining claws are respectively formed as axial retaining grooves wherein the longitudinally extending fitting members are fittable with matching countersurfaces of correspondingly equal radial dimension so that a respective sliding surface pair is formed by the fitting surface of the groove widening and the fitting countersurface of the longitudinally extending bar in engagement therewith, the cross-bar of the respective retaining claws being secured in position by form-locking engagement with both longitudinally extending bars whereby the longitudinally extending bars, in turn, are secured against falling out in axial direction. This security against falling or slipping out in axial direction is provided for the longitudinal bars, as noted more fully herein below principally by providing the longitudinal bars with squared-off surfaces at their outer end which abut with the outer end face of the retaining claw, and tightly bolted or screwed thereto. This tight bolting in the vicinity of the squared-off surfaces can be dispensed with, however, if the longitudinal bars are flush at their free end faces, with the front end faces of the pot-shaped outer housing, so that the outer sealing cover, which is mounted on these end faces, can simultaneously assume the form-locking securing of the longitudinal bars.

If it is desired that the slot between the head of the retaining claws and the inner periphery of the outer shell should not be too large, in accordance with another feature of the invention with respect to the insertion of the crossbars into their respective pocket spaces, in the peripheral region located between the retaining claws, and annular slot, between the outer periphery of the inner shell and the inner periphery of the outer shell, the annular slot being of such radial width and such axial extension that the respective crossbar is

axially insertable into the same and is slideable in peripheral direction into a peripheral angular region of the pocket space located axially behind the retaining claw, the crossbar, in the peripheral angular region, being displaceable in radial direction within the pocket space located axially behind the retaining claw so as to be engageable, on the one hand, with housing shoulders located at the bottom of the pocket space and, on the other hand, with the rear, axially-normal end face of the retaining claw whereby the retaining claw is securable in this position against falling out.

In accordance with the preferred usage of the invention, the inner shell is an axially subdivided shaft sealing casing, and the outer shell is an outer housing of a steam turbine, the bearing and centering locations being disposed at the cold end of the shaft sealing casing which is accessible from the outside, the hot end of the shaft sealing casing extending into the inner space of the outer housing and being axially and radially-centrally, thermally displaceable therein.

In accordance with yet another feature of the invention, the form-locking position-fixing of the longitudinal bars and the crossbars is achieved by including an axially subdivided sealing cover seatable on an axially-normal annular surface of the outer end wall of the outer housing containing the bearing and centering locations whereby the longitudinally extending bars are secured against falling out.

Other features which are considered as characteristic for the invention are set forth in the appended claims.

Although the invention is illustrated and described herein as embodied in device for radially-centrally, thermally displaceably mounting and centering inner housing shells with respect to the outer housing shells of turbomachines, particularly steam tubines, it is nevertheless not intended to be limited to the details shown, since various modifications and structural changes may be made therein without departing from the spirit of the invention and within the scope and range of equivalents of the claims.

The construction and method of operation of the invention, however, together with additional objects and advantages thereof will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

FIG. **1** is a longitudinal sectional view of a steam turbine of axial construction with an outer housing constructed as a pot housing provided at both ends thereof with the bearing- and centering device of the invention;

FIG. **2** is a transverse view along the plane represented by the line II—II in FIG. **1**, the flange portion of the outer housing being omitted and the longitudinal bar being a modification of that of FIG. **1** by being bevelled at the outer ends thereof;

FIG. **3** is an enlarged fragmentary view of FIG. **1** showing the detail enclosed in the circle A;

FIG. **4** is a view in direction of the arrow E in FIG. **3**, wherein the insertion maneuver of the crossbar is indicated; and

FIG. **5** is a sectional view of FIG. **3** taken along the line V—V in peripheral direction.

The high-pressure partial turbine of axial construction according to FIG. **1** is shown in simplified form, the section lines being omitted. The turbine is made up of the following main parts: the shaft **1**, the blading **2** with rotor blade crowns **2***a* at the outer periphery of the shaft **1** and guide vane crowns **2***b* at the inner periphery of the inner shell **3** that encloses the shaft. The shell **3** is constructed as an axially divided, combined guide vane carrier-inner housing having a pair of shell halves **3***a* and **3***b* as well as a vertical joint or seam **3***c* (see FIG. **2**). Other main parts of the turbine are an outer housing **4** with a pot-like portion **4***a* and a cover portion **4***b*, as well as a joint or seam **4***c* extending in direction normal to the axis of the turbine; two shaft sealing casings **5** and **6** that are sub-divided in axial direction and located in the region where the shaft extends out of the outer housing **4** into the surrounding space; sealing covers **7** and **8** also sub-divided in axial direction and mounted upon the shaft-sealing casing **5** and **6**, respectively, as well as another sealing casing **9**, which is surrounded by the inner housing shell **3** and seals the live-steam room **10** from a casing chamber **11** located between the inner and the outer shells **3** and **4**. The inner shell **3** is provided with an annular collar **3**a with which it bears steam-tightly against the outer housing and the vicinity of a bearing and centering location **12** thereof,and is radially-centrally, thermally displaceable and axially fixed. The bearing between the shells **3** and **4** is further effected in a manner which is not of any further interest with respect to the invention of this application, by the insertion of a sealing U-ring **12***a*, and retaining ring **12***b*, as well as the supporting ring **12***c*. The steam passes from the live-steam inlet **10** through the blading **2**, to a space **13** located at the discharge end of the turbine and from there through an exhaust pipe **14** to a non-illustrated, after-connected intermediate pressure turbine stage or intermediate superheater. By-pass channels **15** help to keep the space **11** at an intermediate pressure. Flange screws **16** are provided for connecting the outer housing portions **4***a* and **4***b* at the axially-normal joint **4***c*. The rotor blading **2***a* is carried by a shaft portion **1***a*. The shaft **1** is also provided with an equalizing piston portion **1***b*. Sealing or packing segments **17** are located at the inner periphery of the shaft-sealing casings **5**, **6** and **9** and sealing covers **7** and **8**, and are subdivided in peripheral direction. These sealing segments **17** form labyrinths with corresponding opposing surfaces located at the outer periphery of the shaft **1**. By-pass channels **18** are formed in the shaft-sealing casings **5** and **6** for attaining defined pressure differences between annular spaces located in succession at the outer periphery of the sealing casings and sealed by U-rings **19**.

The invention will first be described with reference to the shaft-sealing casing **6** with the sealing cover **8**. Both sealing casing halves **6***a* and **6***b* (FIG. **2**), which are clamped together by flange screws **6***d* in the region of the joint **6***c*, are provided with four bearing and centering locations *z* located in a plane disposed normally to the axis of the turbine and symmetrical to the main transverse axes *v* and *h* of the steam turbine. The bearing and centering locations *z* are individually identified as *z***1**, *z***2** (horizontal transverse axis *h*) and *z***3**, *z***4** (vertical transverse axis *v*). The shaft-sealing casing **6**, which is axially insertable into the outer housing **4** is provided at the outer periphery thereof in the vicinity of the bearing and centering locations *z*, with respective radially projecting retaining claws *k*. The outer housing **4** is provided, at appropriate locations of the inner periphery thereof, with axial grooves *n* for respectively accommodating the retaining claws *k* therein (note FIGS. **3** and **5**). On both longitudinally extending

sides of the retaining claws *k* peripherally extending groove enlargements or widenings n_e are formed between first axially extending fitting surfaces *f*1 of the retaining claws *k* and second axially extending fitting surfaces *f*2 of the axial grooves n located in spaced relationship opposite the first surfaces *f*1. The groove enlargements n_e are capable of receiving therein fitting parts in the form of axially insertable longitudinally extending bars *l*.

As is shown particularly in FIGS. 3 and 5, in order to obtain an axially fixed bearing support for the shaft-sealing casing 6 in the region of the bearing and centering locations *z* of the respective axially-normal plane, a pocket space *t* of the groove enlargement or widening n_e is located, as viewed from the outside, axially behind the respective retaining claw *k*, and is formed by reducing the narrower axial groove n with respect to the groove enlargement n_e. Into this pocket space *t*, another fitting member *q* in form of a crossbar is insertable and, as seen in FIGS. 3 and 5, the crossbar rearwardly engages the retaining claw *k* and abuts axially against the housing shoulders *t*1, in the vicinity of the bottom of the pocket *t*, thereby fixing the shaft-sealing casing 6 against displacement in the one axial direction. The shaft sealing casing 6 is fixed against displacement in the other axial direction by the fact that it abuts with annular surfaces *r*1 thereof against corresponding annular shoulder-counter surfaces *r*2 of the outer housing 4. Rings *r*3, *r*4 are inserted between the annular surfaces *r*1 and the annular shoulder countersurfaces *r*2 to effect a more exact axial fixation of the casing 6 and to improve the slideability thereof in radial direction.

The matching or mutually fitting surfaces *f*1 of the retaining claws *k* are formed as axial retaining grooves, respectively, as shown particularly in FIGS. 2 and 4, into which the longitudinal bars *l* with opposite fitting surfaces l_1 of the same radial dimension can be fitted. The respective pair of slide surfaces in the vicinity of the bearing and centering locations *z*, is formed by the fitting surface *f*2 of the groove enlargement or widening n_e and the adjcent opposite fitting surface l_2 of the longitudinal bar *l*. The crossbar *q* of the respective retaining claw *k* is secured in its position by form-locking engagement therewith of both longitudinal bars *l* (note especially FIG. 5). To this end, the longitudinal bars *l* are provided with a step-like offset at the end l_3 thereof that engages the cross-bar *q* and in the inserted position of the bars *l*, they grip with the crossbar *q* by the step section l_4 thereof (FIG. 3). The longitudinal bars *l*, in the embodiment of FIG. 2, are, in turn, securable against slipping out in axial direction, by being screwed, with squared-off surfaces l_5, located at the free end thereof, to the retaining claws *k*. The position of the fastening or securing screws and the appertaining threaded bores is indicated in FIG. 2 at 20. According to FIG. 1 as well as FIGS. 3 to 5, this securing means may also be realized by a form-locking device wherein the aforementioned axially sub-divided sealing cover 8 is mounted upon an axially-normal annular surface 21 of the outer end wall 4*d* of the outer housing 4 which contains the bearing and centering location arangement *z*, the sealing cover 8 establishing with an inner annular surface 21*a* thereof a flush fitting contact with the outer end of the longitudinal bars *l*. FIG. 5 shows one longitudinal bar *l* not yet in the inserted condition thereof, and the arrow 22 indicates the direction of insertion.

A particularly advantageous possible manner of inserting the crossbars *q* is shown in FIG. 4 in connection with FIGS. 3 and 5. As illustrated therein, in the peripheral region located between the retaining claws *k*, there is provided, between the outer periphery of the casing 6 and the inner periphery of the outer housing 4, an annular slot 23 of such radial width 23*a* and such axial extension 23*b* (FIG. 3), that the respective crossbars *q*, shown in FIG. 4 in dotted lines, is axially insertable into the annular slot 23 and is slideable in peripheral direction into the peripheral angular region or sector 23*c* of the pocket space *t*, which is located axially behind the retaining claw *k*. In this peripheral angular region 23*c*, the crossbar *q* (note the arrow 24 indicating the displacement direction), by displacement in radial direction within the pocket space *t* located axially behind the retaining claw *k*, may be brought into engagement, firstly, with the housing shoulders *t*1 of the bottom of the pocket *t*, and secondly, with the rear, axially-normal end face *k*1 of the retaining claw *k*. To effect this displacement maneuver for the crossbar *q*,the latter is provided, at least at one end thereof, with an outwardly directed threaded bore *q*1 into which a bar is threadedly insertable. After the cross bar *q* is placed into its final position shown in solid lines in FIGS. 3 and 5, it is form-lockingly secured in this position by inserting the longitudinal bars *l*, as described hereinbefore. The longitudinal bars *l*, which are in flush alignment with the end wall surface 21 of the outer housing 4 for the purpose of securing by means of the sealing cover 8, are provided, at the outwardly directed end thereof with a threaded bore l_6, as shown in FIG. 4 for threadedly inserting therein a rod or bar in the event they are to be dismantled or disassembled.

As shown by the full view of FIG. 1, the bearing and centering locations *z* are disposed at the cold end of the shaft-sealing casing 6 which is accessible from the outside. The hot end of the shaft-sealing casing 6 which extends into the interior space 11 of the outer housing 4, is mounted so as to be axially and radially centrally, thermally displaceable with the insertion of the U-shaped sealing ring 19. The thermal expansions in axial direction therefore proceed from the axially normal plane of the bearing and centering locations *z*, in direction toward the interior of the housing. In addition to being in sealing engagment with the outer housing 4, the sealing cover 8 also maintains sealing engagement with the shaft-sealing casing 6, namely through the insertion of another U-shaped sealing ring 19*a*.

As is apparent, furthermore, the shaft-sealing casing 6 is mounted, by its bearing and centering device *z*, in the vicinity of the passage through which the shaft 1 extends, at the end wall 4*d* of the hot end, that forms the bottom of the pot-shaped portion 4*a* of the outer housing. Assembly is effected in a manner that the turbine rotor 1 provided with the shells 6*a* and 6*b* of the shaft-sealing casing 6 is insertable in vertical direction into the pot-shaped housing part 4*a*, the casing 6 abutting with its shoulder surfaces *r*1 against the annular counter surfaces *r*2 of the outer housing 4.

The longitudinal bars *l* and the cross bars *q* of the retaining claws *k* can then be inserted from the outside,into the groove enlargements or widenings n_e and *t* of the end wall 4*d*, and the sealing cover 8 can be placed thereover.

The arrangement of the bearing and centering locations at the left end of the turbine shown in FIG. 1, for

the shaft-sealing casing 5 and the sealing cover 7, is provided in a similar manner, and like or corresponding parts are identified by the same reference numerals. There is a difference insofar as the shaft-sealing casing 5 is mounted in the vicinity of the passage through which the shaft 1 extends out of the housing 4, at the end wall of the cold end of the turbine, forming the pot cover 4*b* and, consequently, upon assembly, the pot cover 4*b* formed with the groove enlargements or widenings n_e and t is slipped over the shaft 1, which is provided with the shaft sealing casing 5. The pot cover 4*b*, with its annular countersurfaces *r*2, thereby abuts against the annular shoulder surfaces *r*1 of the sealing casing 5. The weight of the pot cover 4*b*, is absorbed though in the region of the axially-normal joint 4*c*. As described hereinbefore in connection with the shaft-sealing casing 6, the longitudinal bars *l* and the crossbars *q* are insertable from the outside into the groove enlargements or widenings n_e and t, and the sealing lid 7 is placeable thereover.

Although the illustrated embodiments of the bearing and centering arrangement at shaft-sealing casings are particularly preferred, it is understood that the principle of the invention is applicable for bearing and centering accompanied by fixation against axial displacement with respect to turbine-housing inner shells, i.e. inner housings or casings, and/or guide-vane carriers.

I claim:

1. Device for radially-centrally, thermally displaceably mounting and centering an inner shell of a turbomachine housing relative to a pot-shaped outer shell thereof, the inner shell being axially insertable into the outer shell, comprising at least three bearing and centering locations disposed in an axially normal plane and symmetrical to the major transverse axis of the turbomachine, retaining claws radially extending from the outer periphery of the inner shell in vicinity of said bearing and centering locations, the outer shell being formed at corresponding locations of the inner periphery thereof with axial grooves wherein said retaining claws are receivable, said axial grooves being formed, on opposite longitudinally extending sides of said retaining claws, with peripherally extending groove widenings located between first axially extending fitting surfaces of said retaining claws and second axially extending fitting surfaces of said axial grooves and located in spaced relationship to said first surfaces, fitting members in form of axially insertable longitudinally extending bars receivable in said groove widenings, and, to mount the inner shell in the vicinity of said bearing and centering locations of the respective axially normal plane, including a pocket space of said groove widening located, as viewed from the outside, axially behind the respective retaining claw and formed by a reduction of the narrower axial groove with respect to said groove widening, and another fitting member in form of a cross-bar insertable into said pocket space and rearewardly engaging said retaining claw and abutting axially against housing shoulders located in vicinity of a bottom surface of said pocket space, whereby said inner shell is fixed against displacement in one axial direction, said inner shell being formed with annular surfaces abuttable against corresponding annular shoulder-countersurfaces formed on the outer shell whereby said inner shell is fixed against displacement in the other axial direction.

2. Device according to claim 1 wherein said fitting surfaces of said retaining claws are respectively formed as axial retaining grooves wherein said longitudinally extending fitting members are fittable with matching countersurfaces of correspondingly equal radial dimension so that a respective sliding surface pair is formed by said fitting surface of said groove widening and the fitting countersurface of said longitudinally extending bar in engagement therewith, the crossbar of the respective retaining claws being secured in position by form-locking engagement with both longitudinally extending bars whereby said longitudinally extending bars, in turn, are secured against falling out in axial direction.

3. Device according to claim 2 wherein said longitudinally extending bars are formed, at the end thereof engaging said cross bar, with a step-like offset with which said cross bar is gripped.

4. Device according to claim 1 including, in the peripheral region located between said retaining claws, an annular slot, between the outer periphery of said inner shell and the inner periphery of said outer shell, said annular slot being of such radial width and such axial extension that the respective crossbar is axially insertable into the same and is slideable in peripheral direction into a peripheral angular region of said pocket space located axially behind said retaining claw, said crossbar, in said peripheral angular region, being displaceable in radial direction within said pocket space located axially behind said retaining claw so as to be engageable, on the one hand, with housing shoulders located at the bottom of said pocket space and, on the other hand, with the rear, axially normal end face of said retaining claw whereby said retaining claw is securable in this postion against falling out.

5. Device according to claim 1 wherein said inner shell is an axially subdivided shaft sealing casing, and said outer shell is an outer housing of a steam turbine, said bearing and centering locations being disposed at the cold end of said shaft sealing casing which is accessible from the outside, the hot end of said shaft sealing casing extending into the inner space of said outer housing and being axially and radially-centrally, thermally displaceable therein.

6. Device according to claim 5 including an axially subdivided sealing cover seatable on an axially-normal annular surface of the outer end wall of said outer housing containing said bearing and centering locations whereby said longitudinally extending bars are secured against falling out.

7. Device according to claim 6 wherein said shaft sealing casing is mounted, by its bearing and centering locations in vicinity of a passage through which the turbine shaft extends to the outside, at the end wall of the hot end which forms the bottom of a pot-shaped portion of said outer housing, the rotor of the turbine provided with shells of said shaft sealing casing being insertable in vertical direction into said pot-shaped outer housing portion, said shaft sealing casing having shoulder surfaces with which it is in abutting engagement with annular countersurfaces formed on said outer housing, said longitudinal bars and crossbars of said retaining claws being insertable from the outside into said groove widenings of said end wall, and said sealing cover being seatable thereover.

8. Device according to claim 6 wherein said shaft sealing casing is mounted, by its bearing and centering

locations in vicinity of a passae through which the turbine shaft extends to the outside, at the end wall of the cold end of the turbine, which forms a cover portion of said outer housing, said cover portion being formed with said groove widenings and being slideable over the shaft which is provided with said shaft sealing casing so that said cover portion is in abutting engagement by annular counter surfaces provided thereon with annular shoulder surfaces formed on said shaft sealing casing, said longitudinally extending bars and said crossbars being insertable from the outside into said groove widenings, and said sealing cover being seatable thereover.

* * * * *