

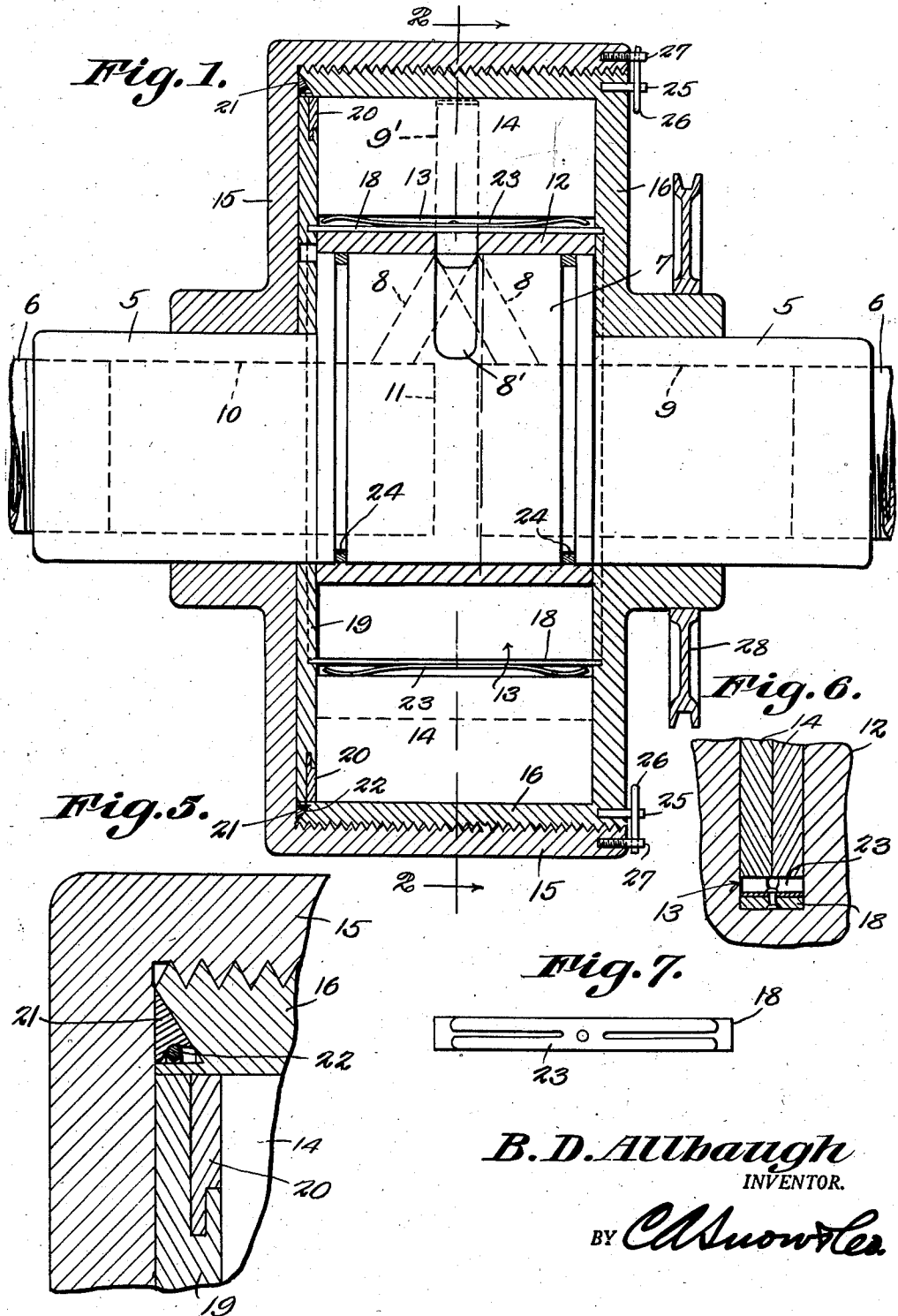
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ROTARY PUMP OR MOTOR

2,380,819

Filed Aug. 21, 1941

2 Sheets-Sheet 1



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INVENTOR.

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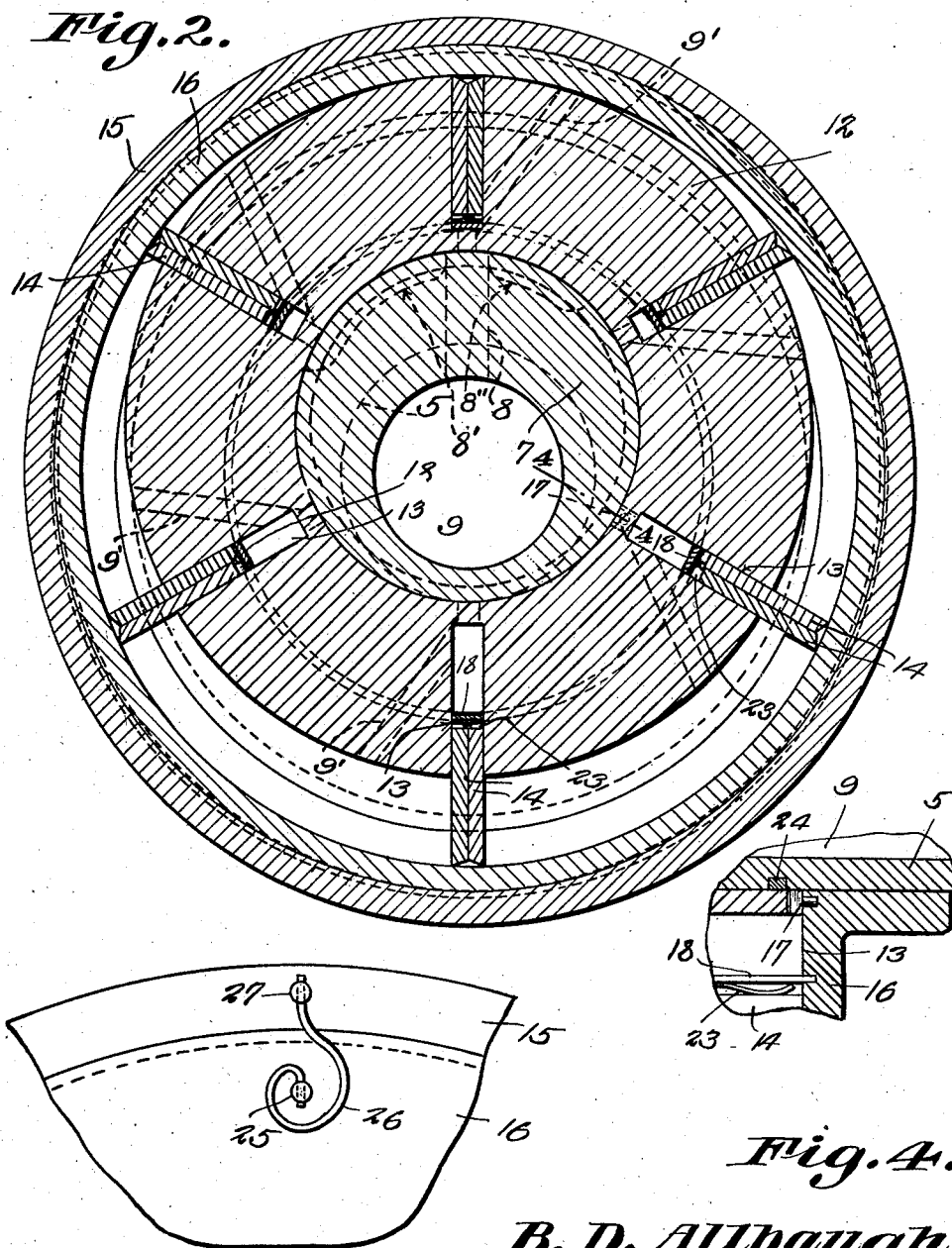
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UNITED STATES PATENT OFFICE

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ROTARY PUMP OR MOTOR

Byron D. Allbaugh, Vallejo, Calif.

Application August 21, 1941, Serial No. 407,792

2 Claims. (Cl. 103—121)

This invention relates to a rotary machine adapted for use either as a rotary engine or pump, the object of the invention being to provide a machine of this character wherein the housing or casing thereof embodies outer and inner sections, rotatable with respect to each other, and means for causing a constant rotary pressure on the sections, to cause the sections of the housing to move with respect to each other, thereby compensating for wear, as well as expansion and contraction between the movable blades of the machine and casing or housing in which the blades move.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts hereinafter more fully described and pointed out in the claims, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

Referring to the drawings

Figure 1 is a vertical sectional view through a machine constructed in accordance with the invention.

Figure 2 is a section view taken on line 2—2 of Figure 1.

Figure 3 is an elevational view illustrating the yieldable means for automatically rotating one section of the housing with respect to the other section to move the sections toward each other.

Figure 4 is a sectional view taken on line 4—4 of Figure 2.

Figure 5 is a fragmental sectional view illustrating the packing means between the movable sections of the housing.

Figure 6 is a fragmental sectional view illustrating the inner end of one of the sliding blades, showing the spring for moving the blade outwardly.

Figure 7 is a plan view illustrating the spring member used in moving the blades outwardly.

Referring to the drawings in detail, the machine comprises hollow bearings 5 which are formed with internal threads to receive the pipe sections 6, through which liquid passes, during the operation of the machine.

The hollow bearings are formed on the member 7 which is substantially wide and formed eccentrically with respect to the bearings 5. Inclined ports 8 are formed in the member 7, one of the ports 8 being in communication with the bore 9, while the other port 8 is in communication with the bore 10. These bores 9 and 10

provide continuations of the hollow bearings 5 the inner ends of the bores being separated by the partition 11. The inclined ports 8 extend to the periphery of the member 7, one of the ports 8 being in communication with the inlet chamber 8' to the end that liquid passing into the inlet chamber 8' must pass to the periphery of the member 7 between adjacent blades 14.

The reference character 12 designates the stator which embodies a wide carrier disk, formed with a concentric opening to accommodate the member 7, and around which the carrier disk operates.

The carrier disk 12 is formed with spaced radiating guideways 13 in which the blades 14 are slidably mounted. Each of these blades comprises a pair of like members, the outer edges thereof being beveled inwardly, presenting substantially narrow surfaces at the outer edges thereof, to contact with the housing of the device, to be hereinafter more fully described.

Extending at oblique angles with respect to the periphery of the disk 12, are exhaust ports 9' that establish communication between the chamber 8'' and the space between the member 12 and housing 15, so that liquid may enter the chamber 8' and act on the blades of the device and exhaust through chamber 8''.

The rotor or housing embodies outer and inner sections 15 and 16, the sections having cooperating threads, so that one section may be fitted within the other, providing a complete enclosure for the blades of the machine.

The carrier disk 12 is secured to the section 16 of the housing, by means of the pin 17, which is shown as extending into the section 16 of the housing, the head of the pin being embedded in an opening of the carrier disk. Thus it will be seen that the housing and carrier disk will stay together.

Mounted in each guideway 13, is a bar 18 that has one of its ends positioned in an annular groove of the housing section 16, the opposite end of each bar being disposed in an annular groove, formed in the disk 19 that is mounted within the open end of the housing section 16. This disk 19 is provided with a packing ring 20 to seal the sections of the housing and prevent leakage between the sections. The present invention embodies more particularly the detail construction as shown by Figure 5 of the drawings which insures against leakage between the sections, by compensating for wear and expansion and contraction between the housing and wide disk 12. The inner edge of the section 16

of the housing is formed with a groove in which the packing ring 21 is positioned, the groove having a beveled or inclined wall cooperating with an inclined wall of the packing ring, as clearly shown by Figure 5 of the drawings. The packing ring 21 is urged outwardly into engagement with the section 15 of the housing, by means of the yieldable ring 22 which is shown as positioned behind the packing ring 21 to urge it outwardly.

The bars 18, provide supports for the spring members 23 that are connected to the bars at points intermediate the ends of the spring members, the free ends of the spring members 23 engaging the blades 14, normally urging them outwardly into engagement with the housing. The housing, together with the carrier disk, rotate around the member 7, and in order that a leak-proof connection between the member 7 and carrier disk 12 will be insured, the member 7 is formed with grooves, in which the rings 24 are mounted, the rings contacting with the carrier disk, as clearly shown by Figure 1 of the drawings.

The sections of the housing are so constructed, that one section fits within the other section, and the sections are formed with cooperating threads, so that the sections may be screwed together.

Secured to the section 16, are pins 25 that are provided with openings for the reception of one of the respective ends of the spring 26 associated therewith. The opposite end of the spring will be extended into an opening of the pin 27 carried by section 15 of the housing. It will of course be understood that these pins 25 and 27 are arranged in predetermined spaced relation with respect to each other so that the pressure exerted by the springs 26, will be evenly distributed to insure the true operation of the springs to accomplish their purpose.

These springs 26 are constructed in such a way that they are placed under tension, with the result that when wear occurs between the blades and housing, the spring members will rotate the

inner section with respect to the outer section of the housing, moving the sections closer together, thereby compensating for this wear.

It will further be seen that the device is rotated in a direction so that the internal friction causes the sections 15 and 16 of the housing to move apart with the result that the springs 26 are placed under tension, with the result that a close fit between the stator and housing is insured at all times.

When the device is to be used as a pump, power is applied to the rotor, through the medium of a belt not shown, and which operates over the pulley 28, secured to the hub of the housing. As the rotor operates, the action of the device will be to pump liquid through the pipes 6.

What is claimed is:

1. In a device of the class described, a stator, a rotor embodying a sectional housing, said housing sections having cooperating threads whereby the sections are moved towards or away from each other when the sections are rotated with respect to each other, pins extending from the housing sections, curved spring arms having their ends connected to the pins and adapted to rotate the housing sections with respect to each other, moving the sections together.

2. In a device of the class described, a stator, a rotor embodying a sectional housing, a threaded annular flange forming a part of each section, the flange of one section adapted to fit within the flange of the adjacent section, said sections adapted to rotate with respect to each other, a packing ring gasket disposed between the edge of one of the flanges and the adjacent section, said packing ring gasket having a beveled surface, the free edge of one of the flanges being beveled and adapted to engage the beveled surface of the gasket, spring arms connected with the sections and adapted to rotate the sections towards each other compressing said gasket and providing a fluid tight connection between the sections.

BYRON D. ALLBAUGH.