Aug. 13, 1929. L. DINESEN 1,724,008

ROTARY PUMP

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Fig. 1

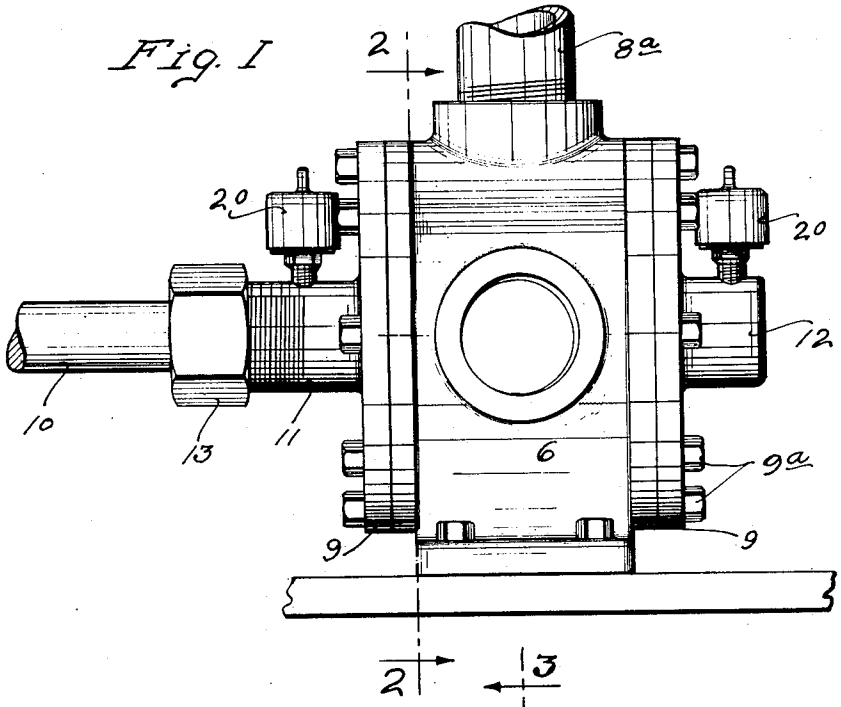
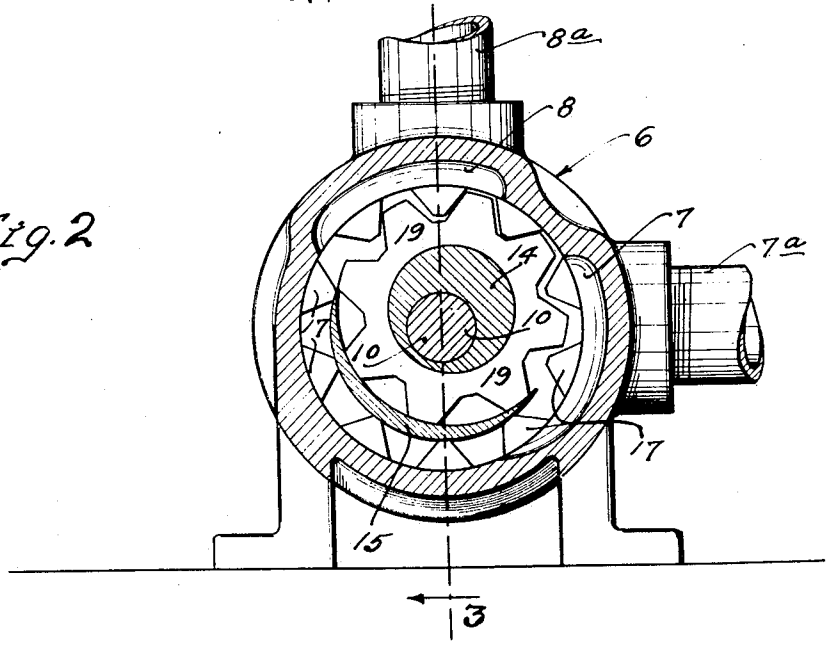


Fig. 2



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Fig. 5

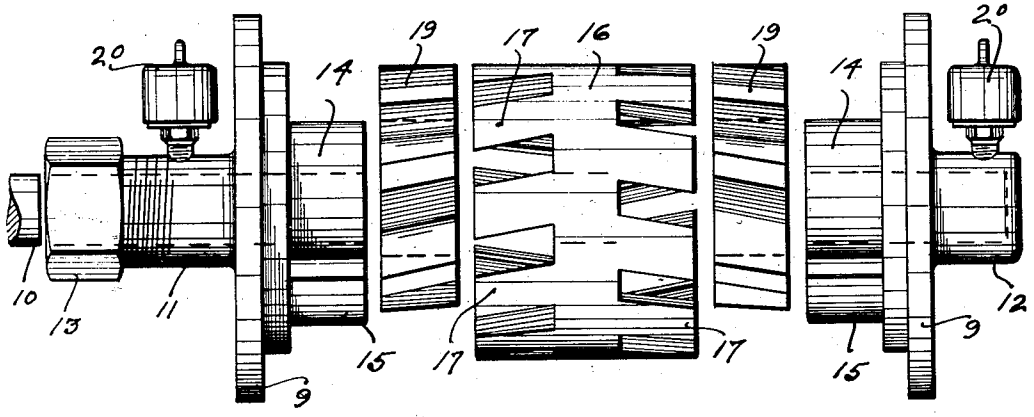


Fig. 3

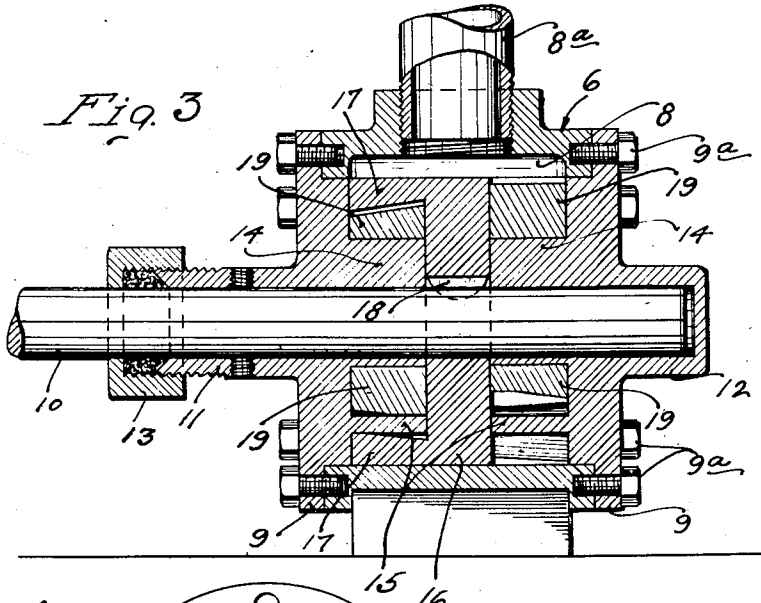
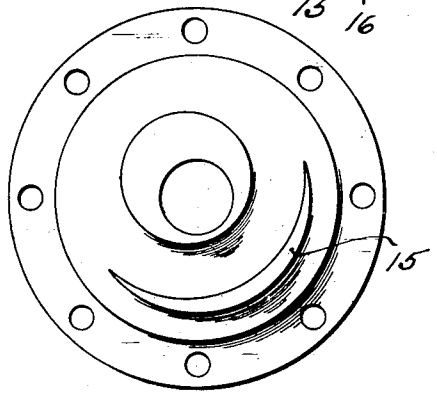


Fig. 4



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UNITED STATES PATENT OFFICE.

LAURITS DINESEN, OF MINNEAPOLIS, MINNESOTA.

ROTARY PUMP.

Application filed August 3, 1925. Serial No. 47,770.

My invention relates to rotary pumps or motors disclosed and claimed in my prior Patents No. 1,515,192 issued of date November 11, 1924 and No. 1,531,904, issued of date March 31, 1925 and entitled "Rotary pump."

The present invention is particularly directed to a duplex arrangement of pump mechanism of my prior patents and wherein a single rotor or annular member is provided with oppositely projected sets of circumferentially spaced teeth or vanes that engage the teeth of co-operating pinions that rotate on an axis eccentric to that of the rotor.

In the accompanying drawings, which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings:

Fig. 1 is a side elevation showing the improved pump;

Fig. 2 is a vertical section taken on the line 2—2 of Fig. 1;

Fig. 3 is a vertical section on the line 3—3 of Fig. 2;

Fig. 4 is an elevation looking at the inner face of one of the cylinder heads; and

Fig. 5 is an elevation showing the rotor, pinions, cylinder heads and shaft drawn axially apart but in axial alignment.

The numeral 6 indicates a cylindrical pump casing having a flanged base by means of which it may be anchored. This casing 6 is provided with a radial intake port 7 and a radial discharge port 8, shown as connected, respectively, to intake and discharge pipes 7^a and 8^a. Cylinder heads 9 are rigidly but detachably secured to the flanged ends of the casing 6 by suitable means such as machine screws 9^a. A power-driven shaft 10, the axis of which is at the axis of the interior of the cylindrical casing 6, is extended through said casing, through a hub 11 on the one cylinder head and into a hub 12 on the other cylinder head. The hub 11, as shown, is provided with a packing gland 13 while the outer end of the hub 12 is closed. The cylinder heads 9 on their inner faces are provided with cylindrical bearing hubs 14 that are eccentric to shaft 10 and interior of the cylindrical casing 6. The cylinder heads 9 at their inner faces are also provided with projecting crescent-shaped partitions 15, the inner surfaces of which are concentric to the exteriors of the hubs 14 and the exteriors of which are concentric to the cylindrical interior of the casing 6.

Rotatably mounted within the cylindrical surface of the casing 6 is a rotor comprising a central ring or annular portion 16 provided with oppositely projected sets of circumferentially spaced teeth or vanes 17. The central ring portion 16 is extended to the shaft 10 and, as shown, is connected thereto by a key 18. Also it is important to note that, as illustrated, the ring 16 works closely against the inner ends of the axially aligned hubs 14 and that the teeth or vanes 17 run against the cylindrical interior of the casing and over the exterior of the crescent-shaped partitions 15. Rotatably mounted on the eccentric hubs 14 are pinions 19, the teeth of which intermesh with the teeth 17 of the rotor and run in close engagement with the concave surface of the crescent-shaped partitions 15.

In the preferred arrangement, and as illustrated in the drawings, the teeth of the pinions 19 and the teeth 17 of the rotor are obliquely set in respect to planes that radiate from the axes of the pinions and rotor. By reference particularly to Fig. 5 it will be noted that the teeth of one pinion are reversely oblique in respect to the other and that the teeth on the one side of the rotor are reversely oblique in respect to the teeth on the other side. This neutralizes all driving forces that might tend to press the rotor axially in the one direction more than in the other. Also, the teeth on the opposite side of the rotor are preferably staggered or set circumferentially, the one ahead of the other, so as to render more constant or unvarying the delivery of water out of the discharge passage of the pump.

In Figs. 2 and 5, the numeral 20 indicates grease cups applied to the hubs 11 and 12.

With the arrangement described it is evident that when the rotor is rotated in a clockwise direction in respect to Fig. 2 that water will be drawn in through intake port 7 and pipe 7^a and will be forced outward through discharge port 8 and pipe 8^a. Power to drive the pump is assumed to be transmitted through the shaft 10 but it will be understood that if water under pressure should be forced into the pump through pipe 7^a and port 7 and out through port 8 and pipe 8^a the device would then be converted into a rotary motor and the shaft 10 would be rotated by the forced passage of the water through the pump.

What I claim is:

1. In a rotary pump, a cylindrical casing having heads, a shaft extending axially into the casing, a rotor having a central web portion rigidly secured to the shaft, said rotor having two sets of oppositely directed relatively staggered and reversely oblique teeth extending longitudinally from said web portion, said heads having eccentric hubs extending to said web portion, and a pair of pinions loosely journaled on said hubs and engaging the aligned teeth of the rotor, said heads having formed therewith crescent-shaped partitions interposed in the space between the separated teeth of the pinion and rotor.

2. In a rotary pump, a rotor comprising a central ring portion having oppositely directed sets of circumferentially spaced vanes, and pinions eccentrically mounted with respect thereto and meshing with said sets of vanes.

3. In a rotary pump, a rotor comprising a central ring portion having sets of oppositely directed relatively staggered vanes extending longitudinally from said ring portion, and pinions eccentrically mounted with respect thereto and meshing with said sets of vanes.

4. In a rotary pump, a cylindrical casing, of a rotor having oppositely projected circumferentially spaced propelling vanes working against the interior of said casing, a shaft extended axially into said casing and connected to rotate with said rotor, and a pair of pinions eccentrically mounted in said casing, one on each side of the central portion of said rotor and engaging the aligned teeth of said rotor, said casing having intake and discharge ports.

5. A rotary pump comprising a casing, a rotor journaled in said casing and having sets of oppositely directed relatively staggered vanes extending longitudinally from said rotor, pinions eccentrically mounted with respect thereto and meshing with said sets of vanes, said casing having heads formed with crescent-shaped partitions interposed in the space between the separated vanes of said pinions and rotor.

6. The structure defined in Claim 5 in which said heads are provided with eccentric hubs on which said pinions are rotatably mounted.

7. The structure defined in Claim 5 in which said heads are provided with eccentric hubs on which said pinions are rotatably mounted, the said rotor having a central web portion secured to said shaft and working closely between said pinions, hubs and eccentric partitions.

In testimony whereof I affix my signature.

LAURITS DINESEN.