Jan. 6, 1953 J. R. ALLSUP, SR 2,624,282

ROTARY VANE MOTOR OR PUMP

Original Filed March 6, 1947

Fig. 1.

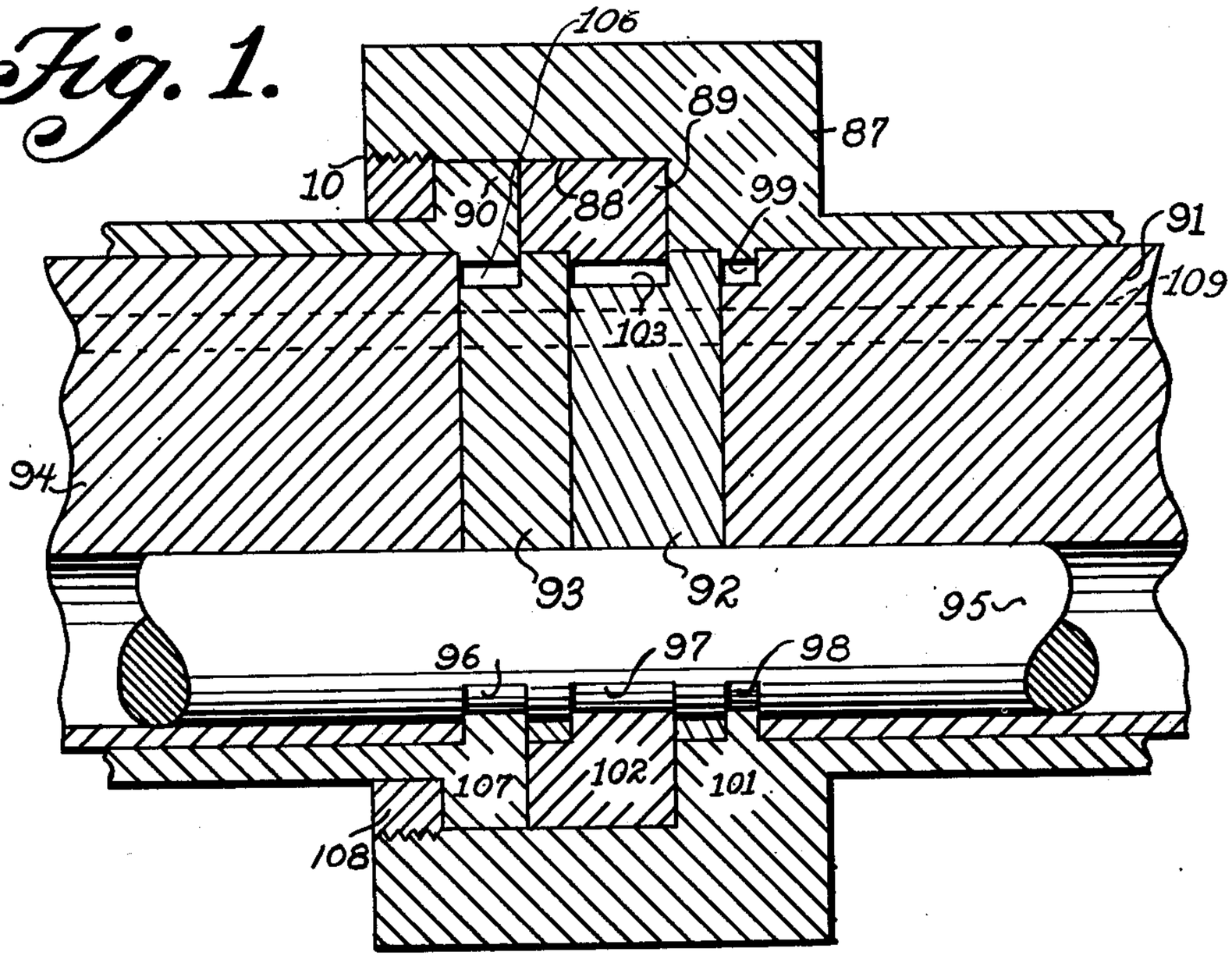


Fig. 2.

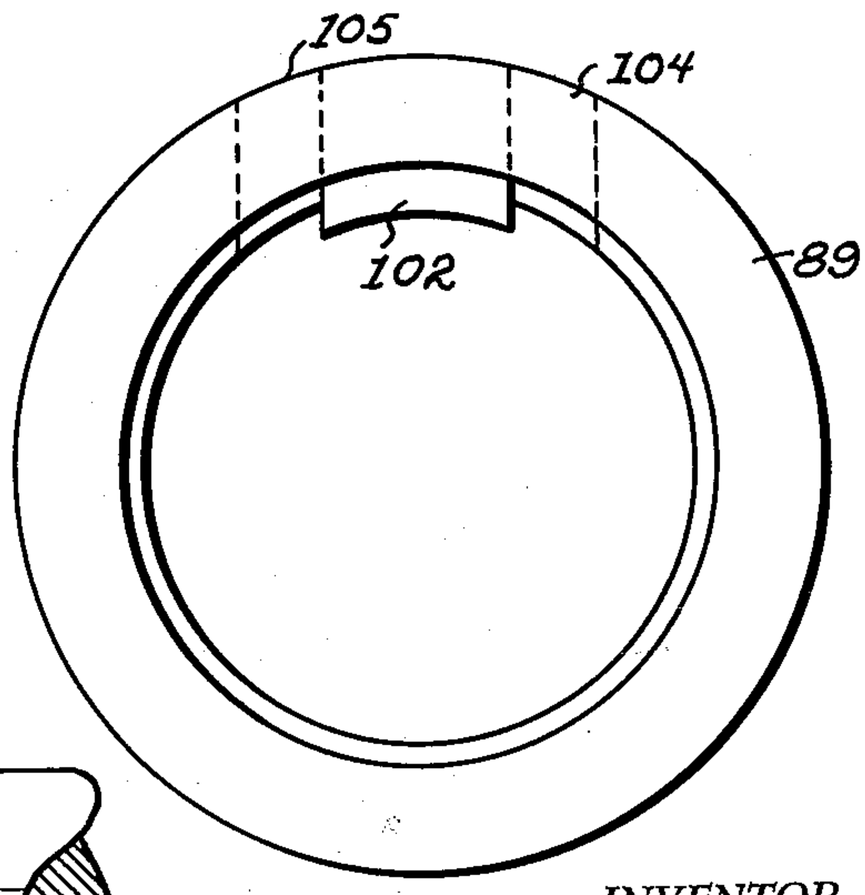
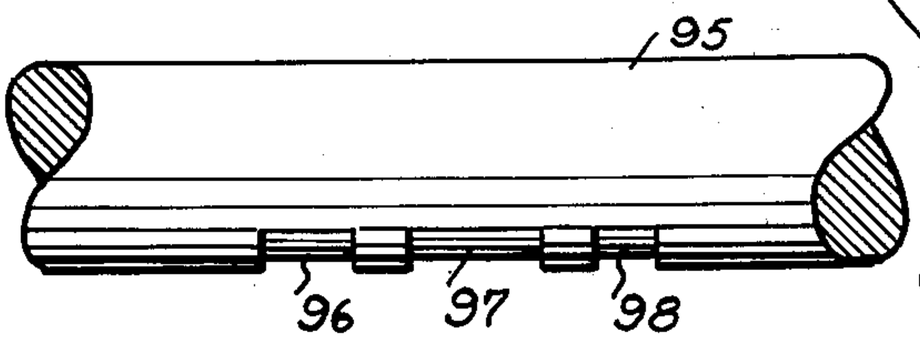


Fig. 3.



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2,624,282

ROTARY VANE MOTOR OR PUMP

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Original application March 6, 1947, Serial No. 732,888. Divided and this application September 8, 1947, Serial No. 772,879

2 Claims. (Cl. 103—4)

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This invention relates to hydraulic motors and pumps, and more particularly to the construction of the stationary housing and rotary parts, and is a divisional application of my co-pending application for motor filed March 6, 1947, Serial No. 732,888, which matured into Patent 2,508,356.

It is an object of the present invention to provide a rugged fluid motor or pump which can be used to hydraulically propel automotive vehicles, ships or locomotives and to eliminate the use of mechanical transmission from such conveyances.

It is another object of the present invention to provide a hydraulic motor or pump with a simple timing arrangement for setting the rotary piston elements for use as vanes in the path of the liquid and wherein the entering and leaving passages of the liquid are separated from one another by a simple projection or structure which is a separate part of the main housing and can be removed for replacement after it has been worn and wherein this projection is avoided by the rotary piston elements by the timing mechanism.

Other objects of the present invention are to provide a hydraulic motor or pump which is of simple construction, easy to assemble, made of minimum parts and efficient in operation.

For other objects and for a better understanding of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawing, in which:

Figure 1 is a fragmentary and enlarged longitudinal cross-sectional view of an embodiment of the invention having a multiple number of vanes whereby to provide a hydraulic motor which can have several different speeds;

Figure 2 is an end elevational view of one of the internal rings of the invention, as shown in Figure 1;

Figure 3 is a fragmentary side elevational view of one of the rotary pistons of the invention shown in Figure 1.

Referring more in particular to the drawing, there is shown a form of the invention which is similar to, but forms an improvement over, the form of the invention shown and described in my co-pending application for motor, filed March 6 1947, Serial No. 732,888 which matured into Patent 2,508,356. This form of my invention provides a hydraulic motor or pump which will have several different speeds.

The motor comprises an outer casing 87 having an internal annular recess 88, which is adapted to receive two rings 89 and 90. The recess 88 is internally threaded at its outer open end, as shown at 10 for a purpose to be later described. Within

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the casing 87 is a rotor structure comprising four separable parts 91, 92, 93 and 94, having alined openings therethrough for rotary pistons 95 which, in their outer surface are provided with a plurality of flattened recesses 96, 97 and 98. The part 91 has an annular recess 99 on its inner end, into which there is extended a radially inwardly extending projection 101 of the casing part 87. This recess 99 and projection 101 are aligned with the flattened recesses 98 of the rotary pistons 95. The ring 89 has a radially inwardly extending projection 102 adapted to extend into flattened recesses 97 and between the rotor part 92 and connecting part 89 is annular passage 103 through which liquid is extended and emitted by way of passages 104 and 105, in the casing 87.

Extending between the rotor part 93 and the annular ring 90 is a liquid passage 106 into which there is extended a projection 107 of the ring 90 adapted to pass through the flattened recesses 96 of the rotary pistons 95. Separate passages govern the flow of liquid to the annular passages 99, 103 and 106. It will be noted that these passages are of different length and hence of different volume so that by separately supplying the different passages or by jointly supplying two of the passages or by supplying all three passages at once, the rotor can be operated at several different speeds.

A retaining ring 108 received in the internal threads 10, secures the rings 89 and 90 within the casing 87. Tie-rods 109 hold the rotor parts together in this form of my invention. A timing mechanism such as that shown in my co-pending application which matured into Patent 2,508,356 will be used to register the flattened recesses with the radially inwardly extending projections at the proper time.

In operation, when liquid is extended into the casing 87, under pressure, and into the annular passage 103, the rotor structure will be rotated. As the pistons 95 approach the separating projections 101, 102 and 107, the pistons will be turned so that their flattened surfaces 96, 97 and 98 respectively will ride under their cooperating projections, and be free of them. The timing of the rotary pistons is effected by the timing device shown in my co-pending application which matured into Patent 2,508,356. After the rotary pistons arrive at the projections, the pistons will be automatically turned to permit the projections to pass through their cooperating surfaces.

While various changes may be made in the detail construction, it shall be understood that such changes shall be within the spirit and scope of the

prevent invention as defined by the appended claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A rotary vane motor or pump comprising an outer casing having inlet and outlet passages and formed of several parts having a radially inwardly extending projection upon each of certain of said parts, a cylindrical chamber in the casing parts, a rotor structure of smaller diameter than said chamber and concentric therewith and adapted to be rotated within the chamber in the casing, and the radially inner surface of each of the radially inwardly extending projections each having a running clearance with the peripheral surface of the rotor, said rotor structure comprising a plurality of parts having a longitudinally extending opening therethrough, a rotary piston lying within the opening and having flattened recesses thereon adapted to be aligned with the radially inwardly extending projections on the casing parts to free the rotor of the casing, and the flattened recesses on the rotary piston fit the radially inner surface of the radially inwardly extended projections, inlet and outlet

passages for said chamber, said radially inwardly extending projections located between said inlet and outlet passages and serving as a barrier to the separate inlet and outlet passages of the outer casing and a timing means on said casing parts for ensuring that the flattened portions of the piston register with the radially inwardly extending projections.

2. The invention as in claim 1 wherein said outer casing comprises an outer part provided with an internal annular recess, and a plurality of rings in said recess through which said rotor passes and each of said rings is provided with one of said inwardly extending projections.

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The following references are of record in the file of this patent:

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