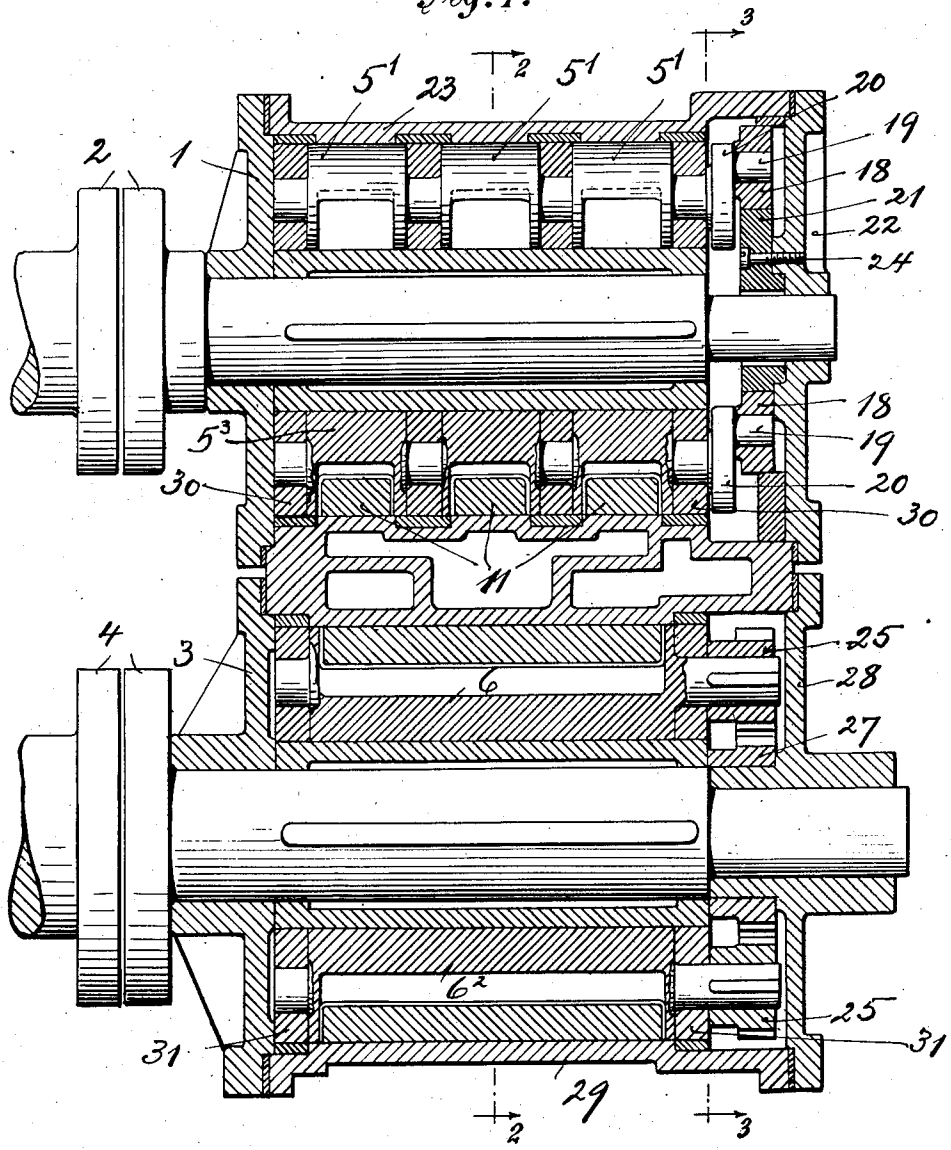
Dec. 15, 1925. 1,565,401

E. SCHAEREN

PUMP CONSTRUCTION FOR HYDRAULIC TRANSMISSION GEARS

Filed Nov. 13, 1922 3 Sheets-Sheet 1

Fig. 1.



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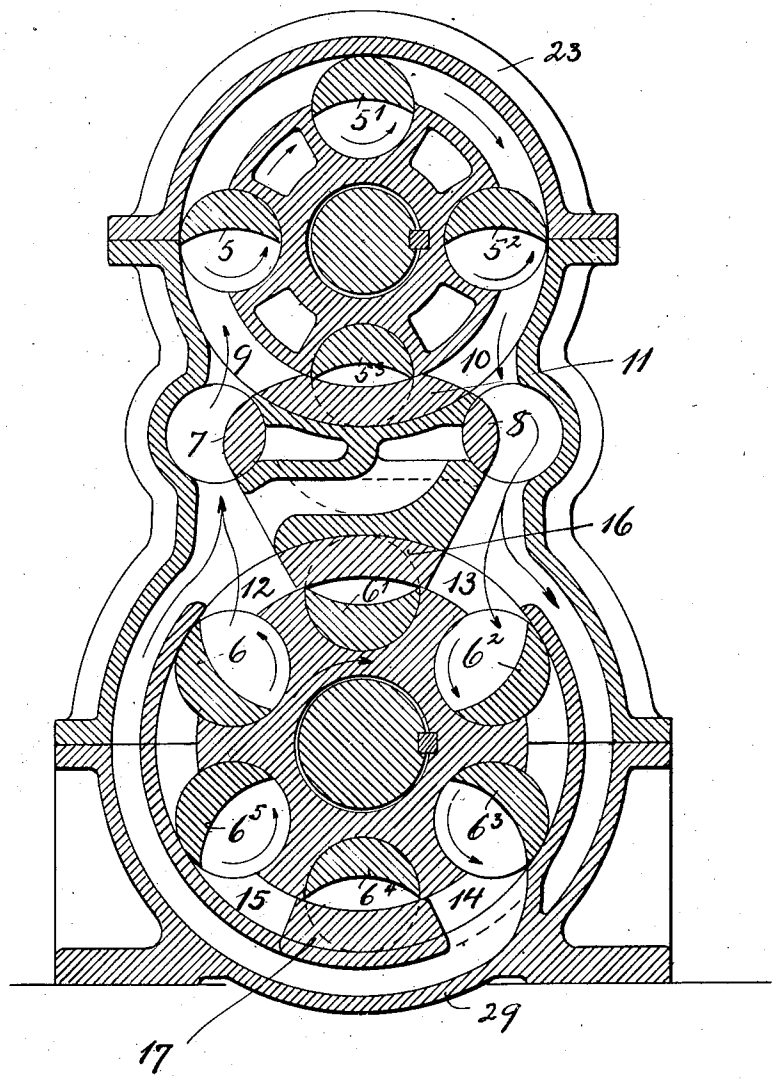
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Fig. 2.



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Filed Nov. 13, 1922 3 Sheets-Sheet 3

Fig. 4.

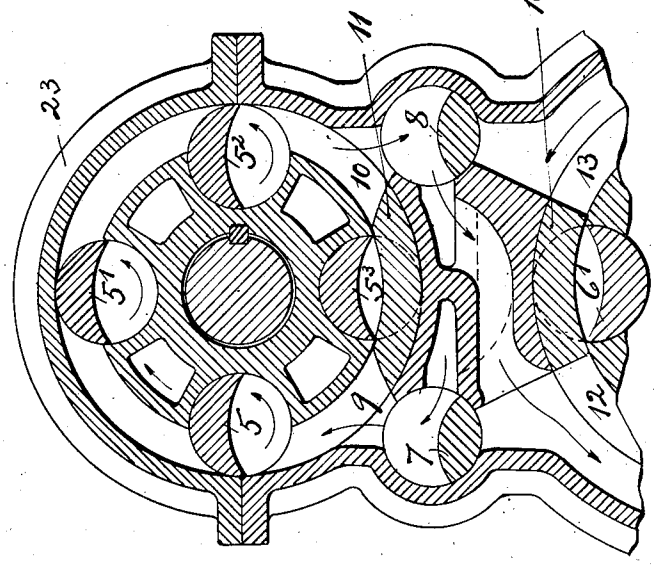
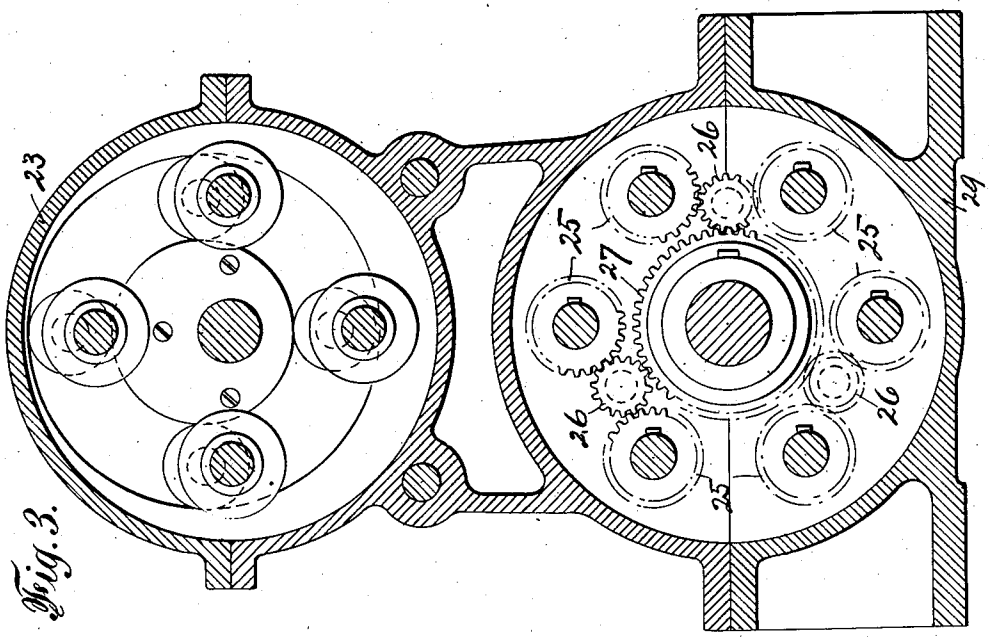


Fig. 3.



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Patented Dec. 15, 1925. 1,565,401

UNITED STATES PATENT OFFICE.

ERNST SCHAEREN, OF WINTERTHUR, SWITZERLAND, ASSIGNOR TO WILLIAM HEINECKE, OF NEW YORK, N. Y.

PUMP CONSTRUCTION FOR HYDRAULIC TRANSMISSION GEARS.

Application filed November 13, 1922. Serial No. 600,545.

To all whom it may concern:

Be it known that I, ERNST SCHAEREN, a citizen of the Swiss Confederation, residing at Winterthur, in the Canton of Zurich and Confederation of Switzerland, have invented certain new and useful Improvements in Pump Constructions for Hydraulic Transmission Gears, of which the following is a specification.

My invention has reference to a pump construction as used in hydraulic transmission gears in which a pump driven by a power engine transmits power to a motor by means of a liquid which is preferably oil.

An object of the invention is to provide rotary vanes in the pump construction cooperating with the casing wall.

Another object is to provide eccentrically mounted controlling means for rotating the vanes in the pump construction.

A further object is to render the pump capable of varying its rate of speed by providing several stages in the pump.

A further object is to render the rotation of the vanes in the pump absolutely certain and exact and thereby providing a pump which is extremely unlikely to become inoperative.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a sectional elevation of a transmission gear showing my novel pump therein.

Figure 2 is a transverse section along line 2—2 in Figure 1.

Figure 3 is a transverse section along line 3—3 in Figure 1, and

Figure 4 is a similar view to that shown in Figure 2, but with the lower portion broken away and showing some of the movable parts in a different position.

Similar numerals refer to similar parts throughout the several views.

The pump is connected by a coupling 2 with the power engine, not shown, and the motor 3 is connected by a coupling 4 with the driven element, not shown.

In the pump 1 are journalled the rotary vanes 5, 5^1, 5^2, etc., forming 3 stages. In the motor, rotary vanes 6, 6^1, 6^2, etc., are provided. The arrows shown in Figure 2 indicate the direction of rotation of the pump 1 and of the rotary vanes journalled in the pump.

The valves 7 and 8 control the entrance of fluid to the motor and the direction in which the motor is driven.

In the pump there is provided for each stage one suction space, 9, and one pressure space, 10, which spaces are separated by abutments 11. To enable the rotary vanes to pass these abutments, the vanes are provided with recesses which, as the vanes pass, register with the abutments. It will be noted that the rotary vanes are journalled concentric with the axis of the pump and that they rotate in a direction opposite to the rotation of the pump.

The rotary vanes in the pump make one complete revolution for each revolution of the pump and this is accomplished by the following described mechanism.

As shown in Figure 1, a coupling disk 18 is provided, having holes therein, into which enter the pins 19 of cranks 20 mounted on the projecting ends of the axes of the rotary vanes. The operation of the coupling disk is effected by an eccentric 21, which is secured to the stationary cover 22 of the closed casing 23 by screws 24, one of which is shown in Figure 1. The eccentric 21 is disposed in a corresponding bore in the coupling disk, 18. The bore in the coupling disk for the crank pins 19 are concentric to the bore in the coupling disk for the eccentric 21. The rotary vanes rotate in divided bearings 30.

The operation of the device is believed to be obvious from the foregoing description. The power engine drives the shaft carrying the pump in the direction shown by the arrow in Figure 2. The vanes rotating in the drum carry the oil from the suction space 9 and force it around to the pressure space 10. From here it is directed by means of the valves 7 and 8 to either side of the motor desired.

The coupling disk 18 carried by the eccentric 21 rotates the vanes in the pump so as to avoid the abutments 11 and also to efficiently pump the oil to the motor.

Some changes may be made in the construction and arrangement of my pump ap-

paratus without departing from the real purpose and spirit of my invention, and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents, which may be reasonably included within their scope.

I claim:—

1. In a hydraulic transmission gear, a casing enclosing a pump, a drum in said pump provided with peripheral recesses, vanes in said recesses and a coupling disk eccentrically connected to said vanes and mounted upon an eccentric disk upon the casing for rotating the vanes.

2. In a hydraulic transmission gear, a casing enclosing a pump, a drum in said pump provided with recesses, vanes in said recesses, crank pins upon said vanes and an eccentrically mounted freely rotating coupling disk within the casing connected to said crank pins for rotating said vanes.

3. In a hydraulic transmission gear, a casing enclosing a pump, a drum in said pump provided with peripheral recesses, vanes in said recesses and a freely rotating coupling disk within the casing eccentrically connected to said vanes and mounted upon an eccentric disk fixed to the casing for rotating the vanes.

In testimony whereof I affix my signature.

ERNST SCHAEREN.