

June 29, 1926.

C. L. BOISSET

MOTOR

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1,590,225

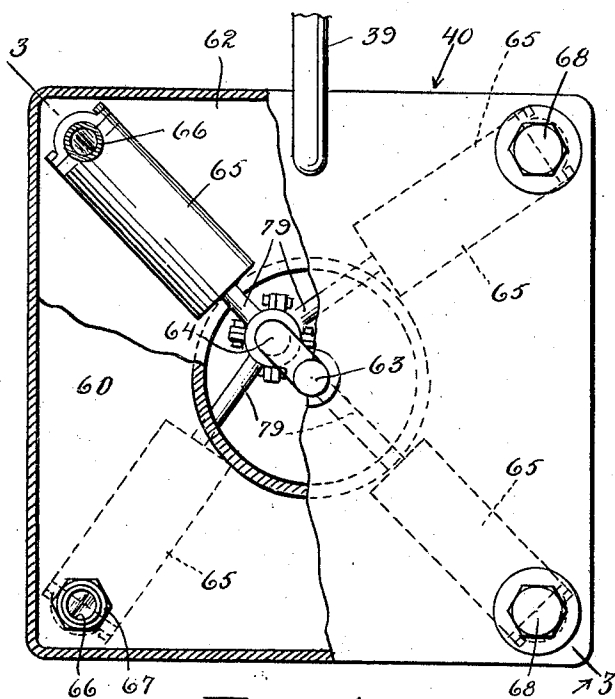


FIG. 1.

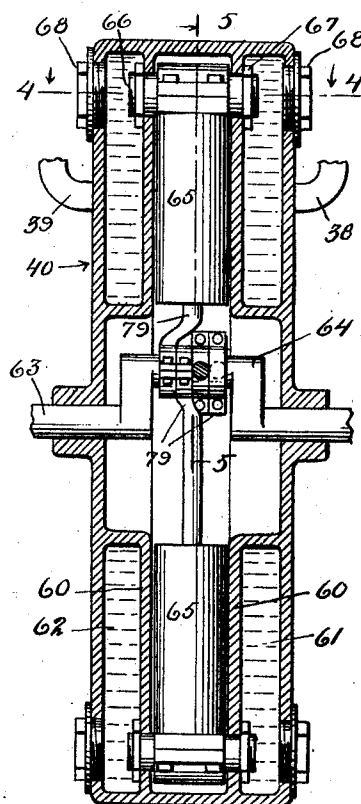


FIG. 2.

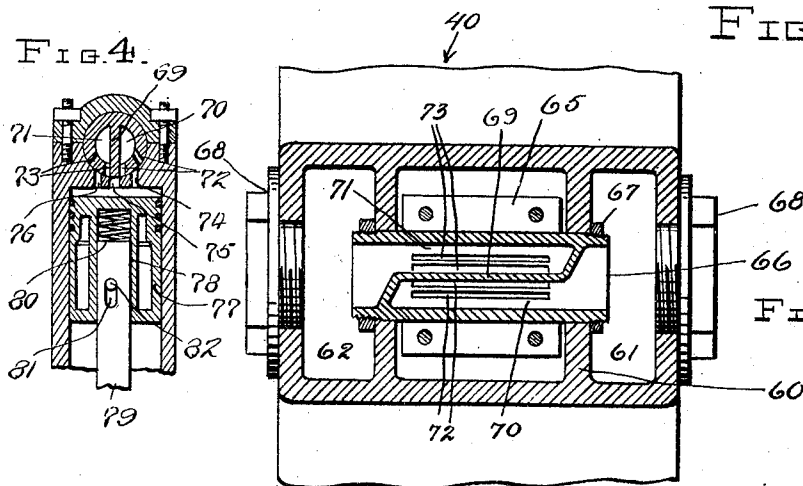


FIG. 3.

WITNESSES

J. Milton Jester

INVENTOR

Chas. L. Boisset

BY

Attorneys

UNITED STATES PATENT OFFICE.

CHARLES LEON BOISSET, OF NEW ORLEANS, LOUISIANA.

MOTOR.

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This invention relates to motive power transmission devices and has for its object the provision of an improved motor for hydraulic transmissions which is operated by power transmitted from a high speed motor of any kind to actuate a propeller at a variable ratio, the high speed motor being possibly an engine such as is used in an automobile, a steam engine, Diesel, electric motor, or any other prime mover, and the propeller being the wheel or wheels of a tractor, truck, automobile, locomotive, or propeller of a ship or boat, the utilization of all these various power and propelling devices falling within the scope of the present invention.

A further object is the provision of a device of this character which includes a motor structure driven by the hydraulic medium, this motor being of novel construction and embodying oscillating cylinders with each of which is associated a distributing sleeve which has an automatic action and which eliminates all necessity for the employment of valves.

With the above and other objects and advantages in view, the invention consists in the details of construction to be hereinafter more fully described and claimed, and illustrated in the accompanying drawings in which

Figure 1 is a view in elevation partly in section showing the improved hydraulic motor,

Figure 2 is a sectional view on the line 3—3 of Figure 1,

Figure 3 is a cross sectional view on the line 4—4 of Figure 2, and

Fig. 4 is a sectional view on the line 5—5 of Fig. 2.

Referring to the invention, the motor comprises a casing divided by partitions 60 which define annular oil chambers 61 and 62. Intake and exhaust pipes 38 and 39 communicate, respectively, with these chambers. One chamber constitutes an intake manifold and the other constitutes an exhaust manifold. Journaled through the center of the motor casing is a propeller shaft 63 which is connected in any desired manner with a shaft to be driven or which may be the ultimate shaft. This shaft 63 is formed within the casing with a crank 64.

Located between the partitions 60 is a plurality of cylinders 65, preferably four in number, and these cylinders are rotatably mounted at their outer ends upon distribut-

ing sleeves or trunnions 66 which are secured transversely through the partitions 60 and which communicate at their ends with the chambers 61 and 62. The ends of these sleeves are secured by nuts 67 threaded thereon. The sides of the motor casing are provided opposite the sleeves 66 with hand holes closed by plugs 68 which permit access to the sleeves when necessary. Each sleeve is divided by a longitudinal partition 69 into separate passages 70 and 71 which communicate, respectively, with the chambers 61 and 62, and each sleeve has formed therein at opposite sides of the partition 69, ports 72 and 73. Each cylinder has formed therein adjacent, the sleeve, ports 74, 75 and 76 which communicate with the bore of the cylinder.

It is to be observed in Figure 4 that there is a little space between adjacent edges of adjacent ports. The purpose of this space is to close before the cylinder reaches the dead center. Naturally, this premature closure leaves some oil in the head of the cylinder, but this is compensated for by the spring 80.

Disposed within each cylinder is a piston 77 provided with the usual packing rings and having a socket 78 within which is disposed a connecting rod 79 connected with the crank 64. It will be observed that all the connecting rods are connected with one crank, as clearly shown. As oil is non-compressible it is necessary to provide some yieldability at the pistons and to accomplish this I interpose a spring 80 between the bottom of the socket 78 and the outer end of the connecting rod. Therefore, the principal purpose of the spring 80 is to enable the piston 77 to yield, as for example, when the ports become closed and there is still a quantity of oil in the cylinder ahead of the piston, which would under ordinary circumstances offer a solid abutment to the piston, sufficient to interrupt the free working of the motor. I also form each connecting rod with a longitudinal slot 81 through which passes a transverse pin 82 carried by the piston.

The operation of the device is as follows:

The oil passes through the pipe 38 into the chamber 61 of the motor and thence into the passages 70 in the sleeve 66, thereupon it passes through the ports 72 into the ports 74 and 75 into the bores of the cylinders, forcing the pistons 77 toward the center of

the motor casing. This movement of the pistons will first compress the springs 80 and will then move the connecting rods 79 and this action will of course result in rotation of the crank 64 and shaft 63. Owing to the fact that the plurality of cylinders will be in different positions with respect to the sleeves 66, one set of ports 72 will be in sufficient registration with the ports 74 and 75 to start the action. As some of the pistons are moving toward the center others will be moving outwardly and when a piston is in such position that it is ready to move outwardly the associated cylinder will be in such angular position as to bring the ports 73 at least partially into registration with the ports 75 and 76 and the oil in the cylinder in advance of the piston will then pass through these ports into the passage 71, into the chamber 62, and through the pipe 39. It is particularly during a working stroke that the joint between the trunnion 66 and cylinder is tightest, and consequently that the likelihood of oil escaping between the ports 72, 74 etc. is farther removed. During such stroke there is an oil pressure between the piston cylinder heads, resulting in a very tight joint around the adjacent half of the trunnion.

While I have shown and described the

preferred embodiment of my invention, it is of course to be understood that I reserve the right to make such changes in the form, construction, and arrangement of parts as will not depart from the spirit of the invention or the scope of the subjoined claim.

Having thus described my invention, I claim:

A motor comprising a casing having a central crank chamber, double partitions defining fluid intake and discharge chambers; a hollow trunnion having support solely upon the partitions, said trunnion being in turn partitioned to provide intake and discharge ducts communicating with the respective chambers, each duct having ports; an oscillatable cylinder occupying the space between the partitions, said cylinder having ports corresponding with the trunnion ports, the ports being arranged to leave spaces between adjacent edges when the cylinder is on dead center; a crank in the crank chamber, a piston in the cylinder having a longitudinal socket, a connecting rod extending into the socket and having a movable connection therewith, and resilient means interposed between said socket and the connecting rod end.

CHARLES LEON BOISSET.