Nov. 30, 1943. F. W. SCHROEPFER 2,335,362

FLUID MOTOR

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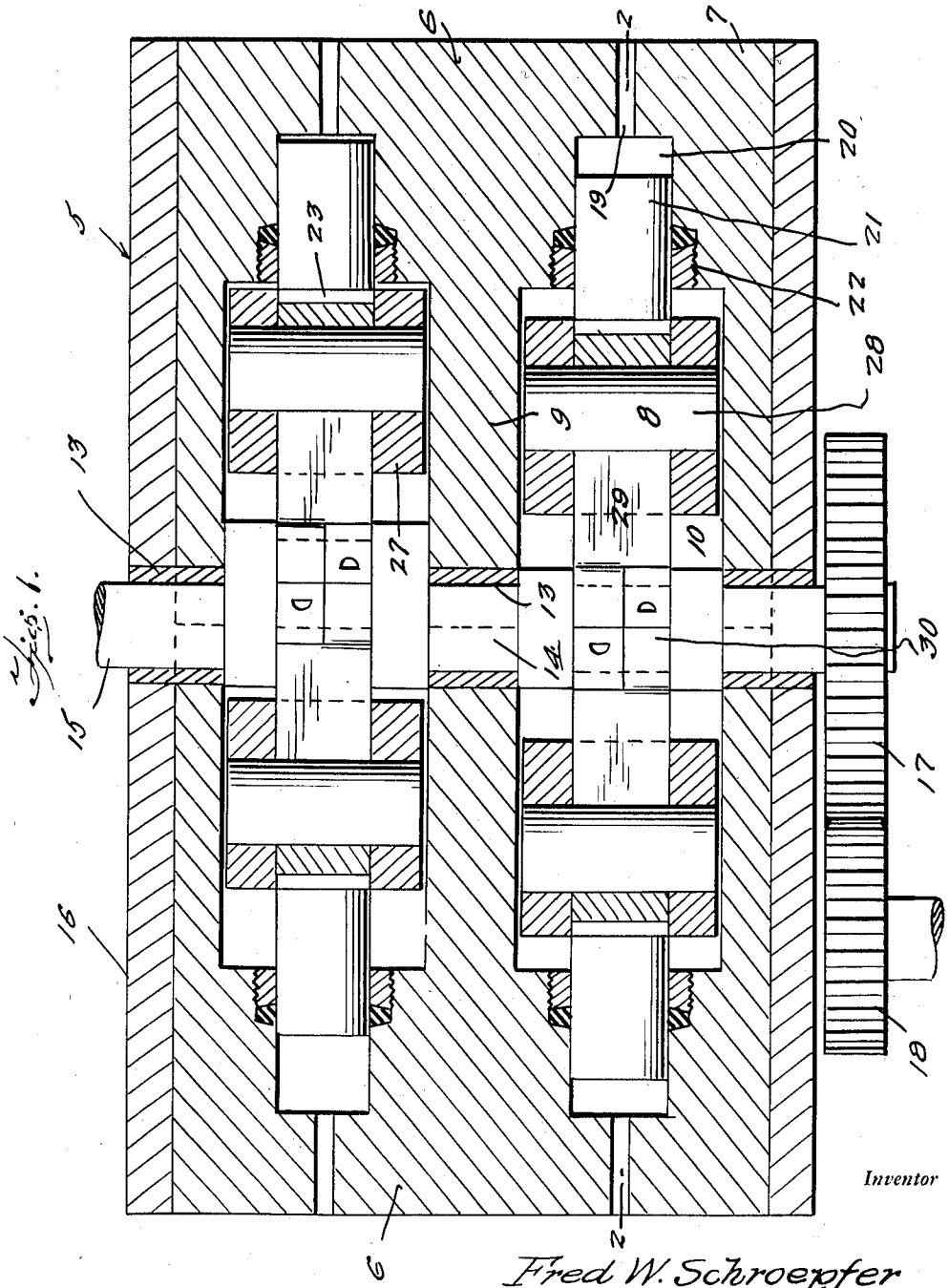


Fig. 1.

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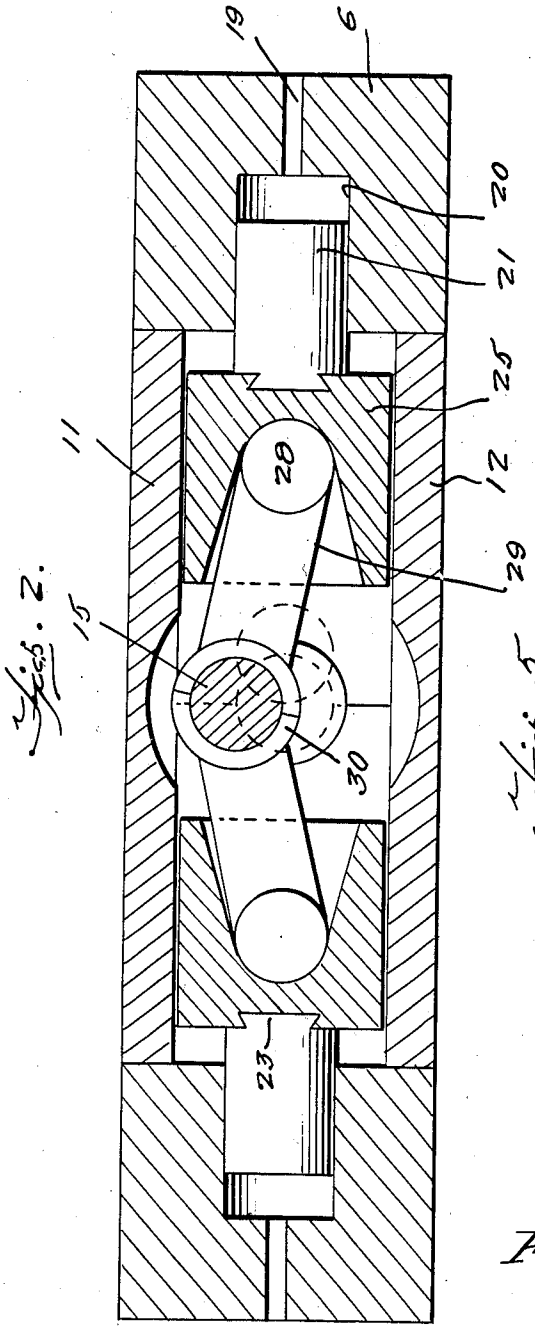


Fig. 2.

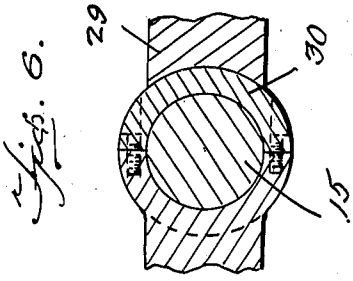


Fig. 6.

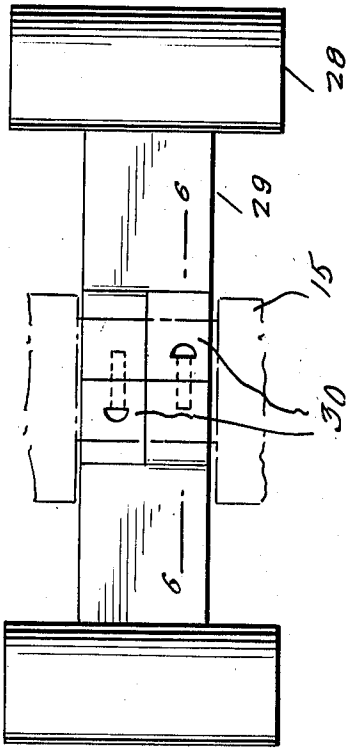


Fig. 5.

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FLUID MOTOR

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Fig. 3.

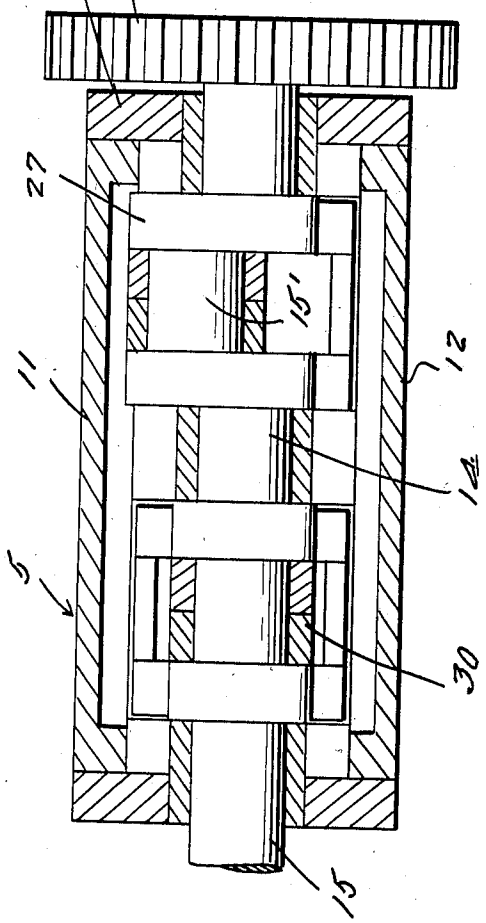


Fig. 8.

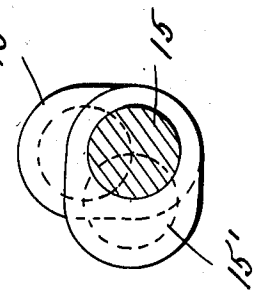
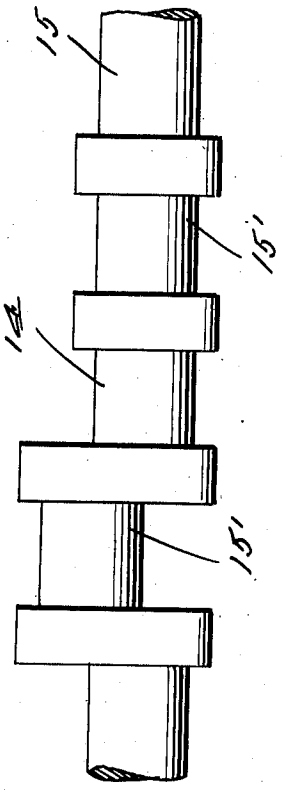


Fig. 7.



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FLUID MOTOR

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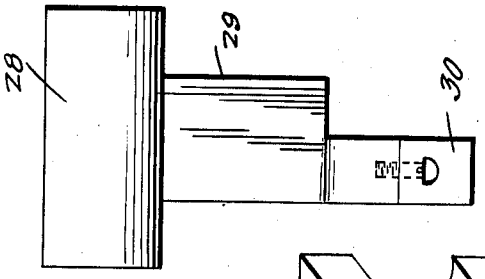


Fig. 11.

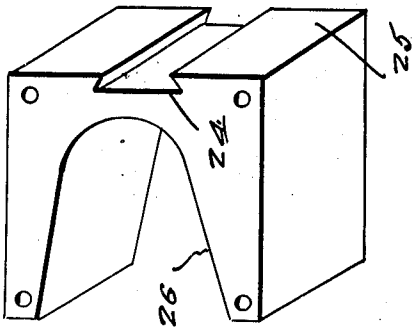


Fig. 9.

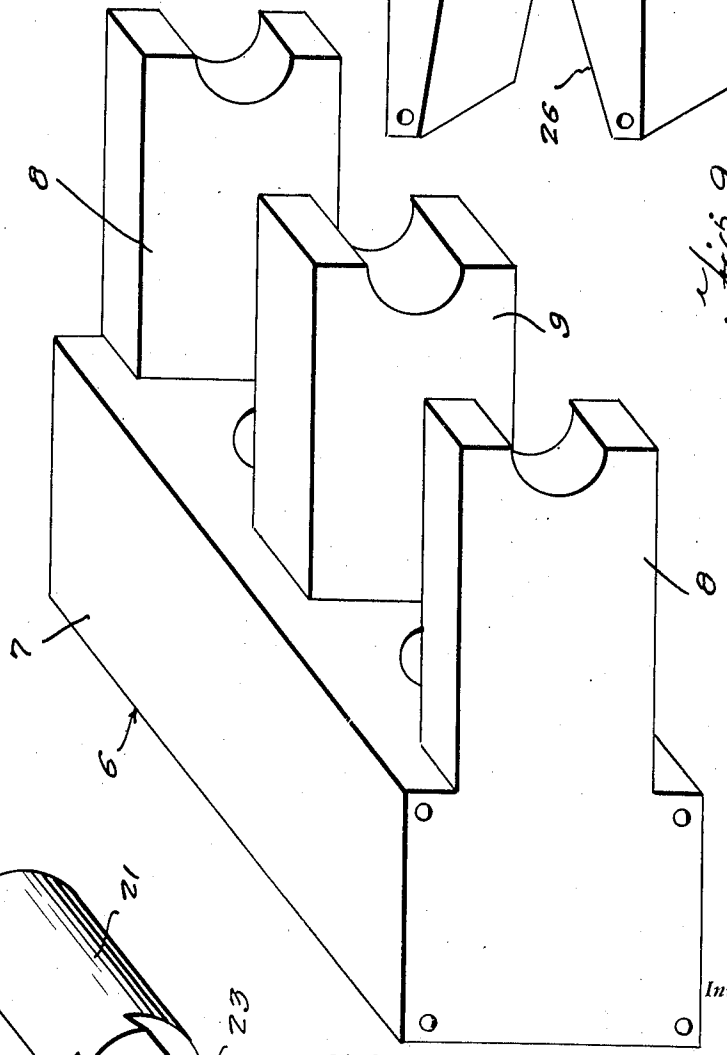


Fig. 4.

Fig. 10.

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Patented Nov. 30, 1943 2,335,362

UNITED STATES PATENT OFFICE

2,335,362

FLUID MOTOR

Fred. W. Schroepfer, Baltimore, Md.

Application August 10, 1942, Serial No. 454,288

5 Claims. (Cl. 74—44)

The present invention relates to new and useful improvements in fluid motors embodying the principles of a hydraulic jack to permit the use of great pressure for conversion into slow or fast motion of a type adapted for various mechanical purposes such as fluid drives, clutch, transmission and brakes on vehicles, also for low or high speed propeller shafts in ships, and for other purposes where a low or high speed under constant, uniform pressure is desired.

An important object of the present invention is to provide a fluid motor unit of simple and practical construction, which is strong and durable, relatively inexpensive to manufacture and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout and in which:

Figure 1 is a longitudinal sectional view of the housing for the motor unit.

Figure 2 is a sectional view therethrough taken substantially on a line 2—2 of Figure 1.

Figure 3 is a fragmentary transverse sectional view showing the crank shaft.

Figure 4 is a perspective view of one of the sections of the housing.

Figure 5 is a detail of one of the double connecting rod units.

Figure 6 is a fragmentary sectional view taken on a line 6—6 of Figure 5.

Figure 7 is a detail of the crank shaft.

Figure 8 is a transverse sectional view thereof.

Figure 9 is a perspective view of one of the blocks connecting the piston and connecting rod.

Figure 10 is a perspective view of one of the pistons, and

Figure 11 is a plan view of one of the connecting rods.

Referring now to the drawings in detail wherein for the purpose of illustration I have disclosed a preferred embodiment of my invention, the numeral 5 designates a housing generally which is composed of a pair of end sections 6—6 of duplicate construction and each including end block 7 having inwardly projecting side walls 8 and an intermediate partition 9 forming chambers 10 closed by top and bottom plates 11 and 12, all suitably secured together in any conventional manner.

The inner ends of the walls 8 and partitions 9 are curved to receive bushings 13 for the bearings 14 of a crank shaft 15, the shaft extending outwardly from opposite sides of the housing through the side plates 16 and one end of the shaft has a gear 17 secured thereto driving a reduced gear 18 which may be connected in a suitable manner to the mechanism to be driven by the shaft. The shaft has cranks 15′ at 45° angles from each other.

Each of the end blocks 7 are provided with passages 19 communicating with cylinders 20 therein and leading from a closed fluid system under a predetermined pressure to be controlled by valves (not shown). In each cylinder is a piston 21 working through a packing gland 22, the piston having a dove-tail inner end 23 conformably fitted in a groove 24 formed in one face of a block 25 positioned in the chamber 10.

The opposite face of the block 25 is formed with a recess 26 closed at the sides of the block by plates 27—27 and in the recess is freely positioned the transverse rod 28 of a T-shaped connecting rod 29. The end of the connecting rod is provided with a split bearing 30, connected to one of the cranks 15′ of the crank shaft, the bearing being substantially one-half the width of the connecting rod so that the bearings of an opposed pair of connecting rods may be connected to each crank as will be apparent from an inspection of Figures 2 and 5 of the drawings.

In the operation of the device fluid pressure is alternately admitted to the cylinders 20 at one side of the housing and exhausted from the cylinders at a relative opposite side to produce a reciprocating motion of the pistons, which in turn is transferred to rotary motion of the crank shaft to drive the latter for any desired useful purpose.

It is believed the details of construction and manner of use of the device will be readily understood from the foregoing without further detailed explanation.

Having described the invention, what is claimed as new is:

1. Means for connecting a piston to a crank shaft and comprising a connecting rod journaled at one end on the crank shaft, a transverse cylindrical rod on the outer end of the connecting rod, a block having a recess in one face freely receiving the transverse rod, a dove-tail connection between the piston and the block, and plates secured to opposite sides of the block and having openings receiving the ends of the transverse rod, said plates abutting the dove-tail connection.

2. Means for connecting a piston to a crank shaft and comprising a T-shaped connecting rod, a split bearing of reduced width connecting the

inner end of the rod to the crank shaft, a transverse cylindrical rod on the outer end of the connecting rod, a U-shaped block freely straddling the transverse rod, and means connecting the block to the piston.

3. Means for connecting a pair of pistons to a common crank of a crank shaft for opposite actuation of the pistons, said means comprising a pair of T-shaped connecting rods, each of said rods including a shank portion having a transverse cylindrical rod at its outer end, and a bearing at its inner end of a width substantially one-half the width of the shank and offset toward one side of the shank to provide a shoulder at the other side of the shank, the bearings of said shanks being positioned in side by side relation on the crank and with the outer surface of the bearing of one shank against the shoulder of the other shank to provide a bearing surface for the entire area of the shank, a U-shaped block freely straddling each transverse rod, and means connecting the blocks to the respective pistons.

4. Means for connecting a pair of pistons to a common crank of a crank shaft for opposite actuation of the pistons, said means comprising a pair of T-shaped connecting rods, each of said rods including a shank portion having a transverse cylindrical rod at its outer end, and a bearing at its inner end of a width substantially one-half the width of the shank and offset toward one side of the shank to provide a shoulder at the other side of the shank, the bearings of said shanks being positioned in side by side relation on the crank and with the outer surface of the bearing of one shank against the shoulder of the other shank to provide a bearing surface for the entire area of the shank, a U-shaped block freely straddling each transverse rod, and a dove-tail connection between the blocks and the respective pistons.

5. Means for connecting a pair of pistons to a common crank of a crank shaft for opposite actuation of the pistons, said means comprising a pair of T-shaped connecting rods, each of said rods including a shank portion having a transverse cylindrical rod at its outer end, and a bearing at its inner end of a width substantially one-half the width of the shank and offset toward one side of the shank to provide a shoulder at the other side of the shank, the bearings of said shanks being positioned in side by side relation on the crank and with the outer surface of the bearing of one shank against the shoulder of the other shank to distribute end thrust throughout the entire inner end of the shank, a U-shaped block freely straddling each transverse rod, and means connecting the blocks to the respective pistons.

FRED. W. SCHROEPFER.