

June 12, 1923.

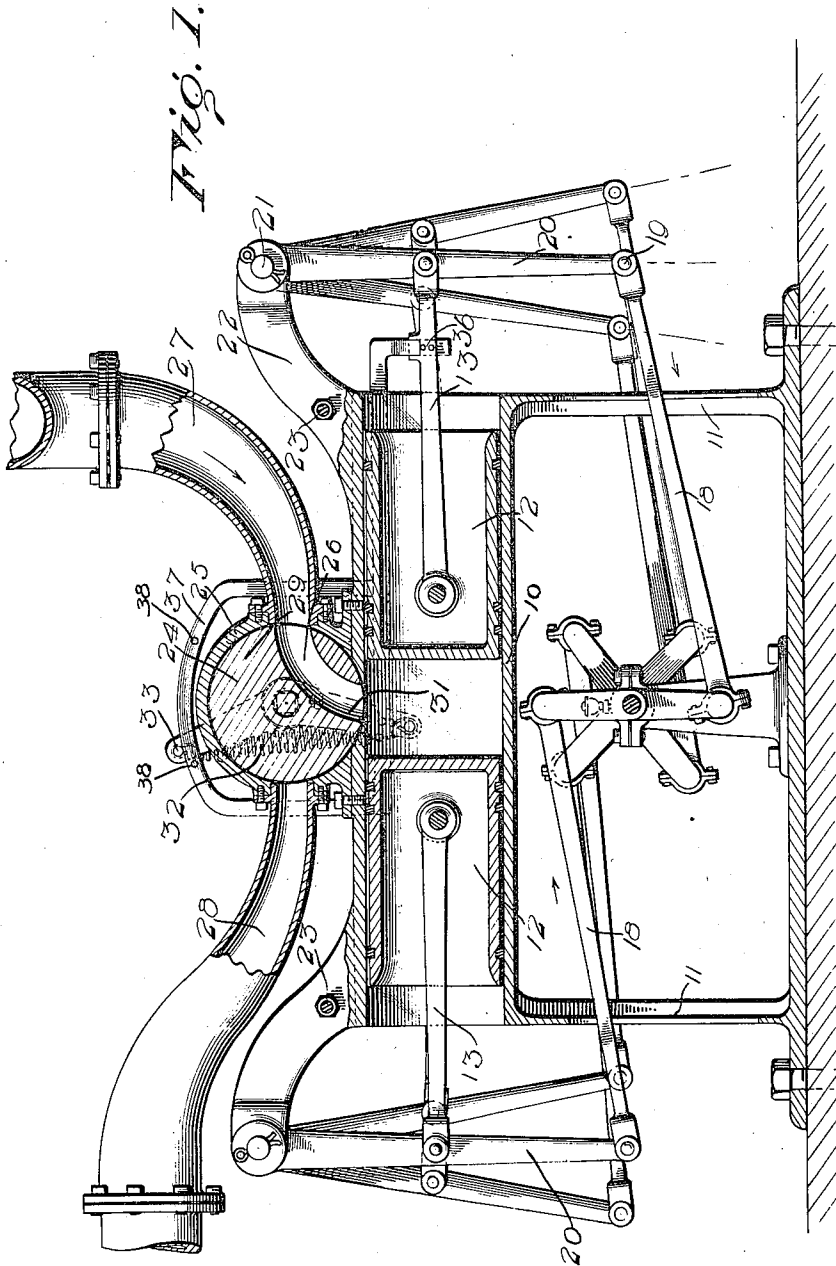
1,458,922

R. RIVERA

HYDRAULIC MOTOR

Filed June 12, 1919

3 Sheets-Sheet 1



INVENTOR
RUBÉN RIVERA.

BY *M. H. Co.*
ATTORNEYS

June 12, 1923.

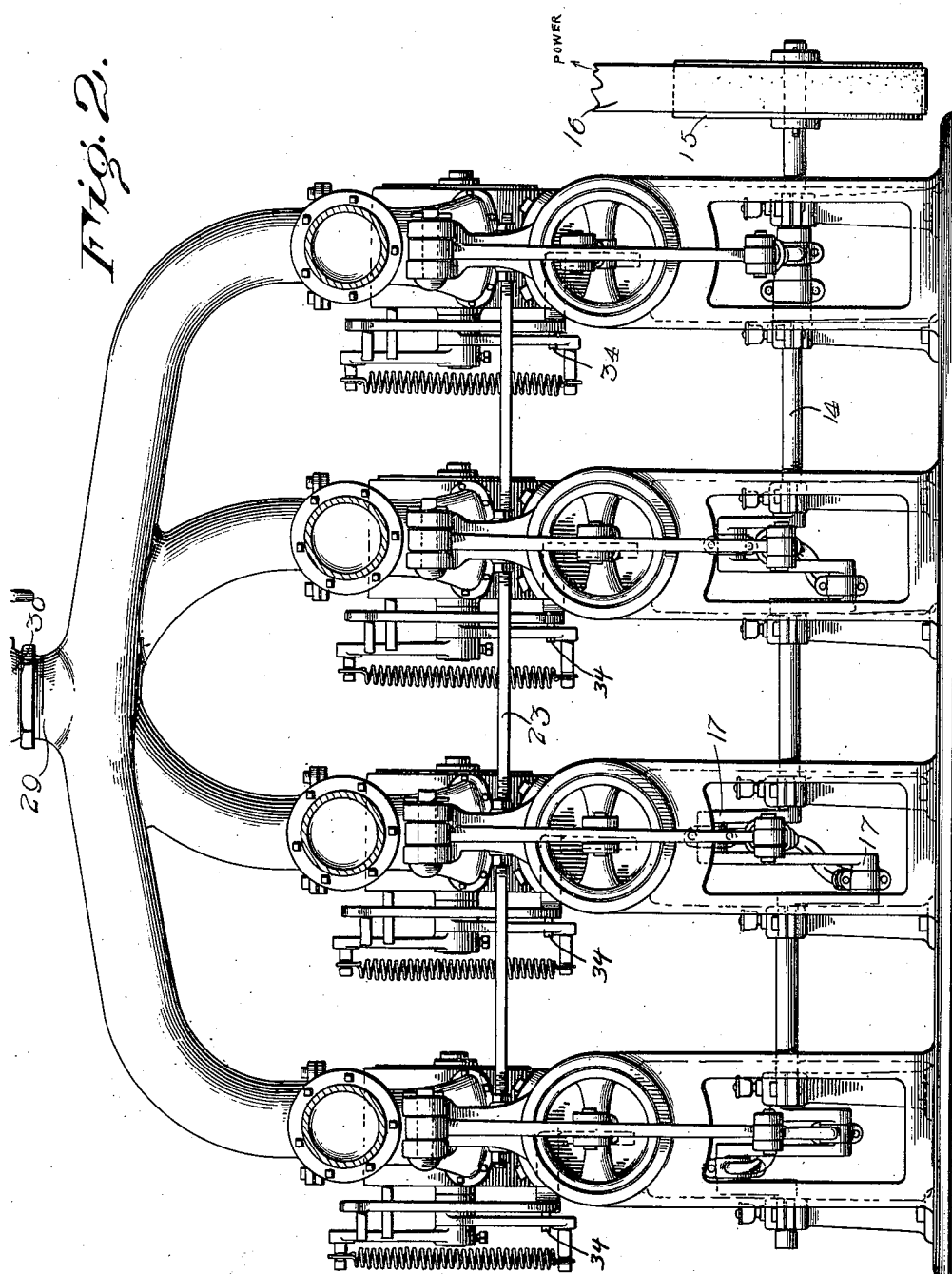
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HYDRAULIC MOTOR

Filed June 12, 1919

3 Sheets-Sheet 2



RUBÉN INVENTOR
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1,458,922

HYDRAULIC MOTOR

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3 Sheets-Sheet 3

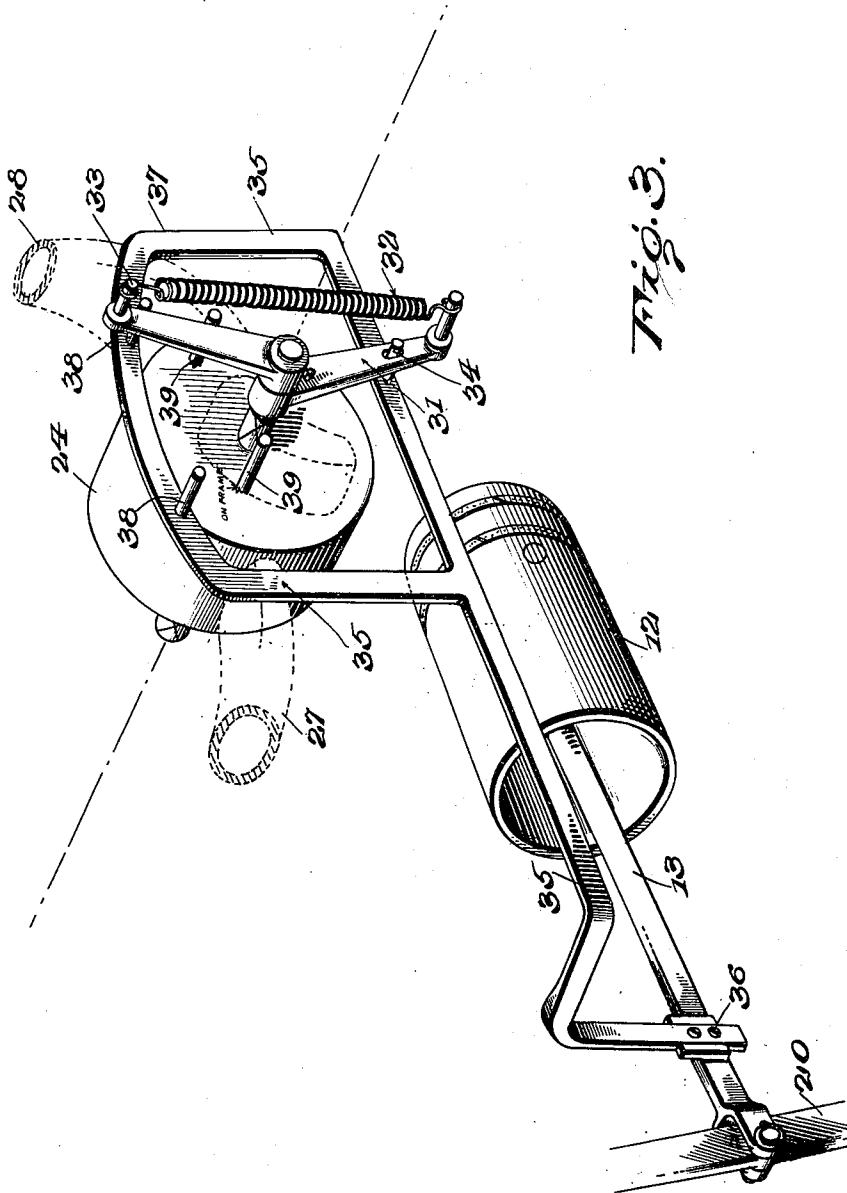


Fig. 3.

WITNESSES

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INVENTOR

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UNITED STATES PATENT OFFICE.

RUBÉN RIVERA, OF SONSONATE, SALVADOR.

HYDRAULIC MOTOR.

Application filed June 12, 1919. Serial No. 303,801.

To all whom it may concern:

Be it known that I, RUBÉN RIVERA, a citizen of Salvador, Central America, and a resident of Sonsonate, Salvador, Central America, have invented certain new and useful Improvements in Hydraulic Motors, of which the following is a specification.

My present invention relates generally to hydraulic motors, and consists more particularly in certain improvements in the type of hydraulic motors to which various patents Numbers 1,219,156, 1,233,913 and 1,233,914 previously issued to me relate, the object of my present improvements being to provide for a simple automatic action through the use of a readily adjustable, readily controlled valve mechanism, one which may be thoroughly and effectively lubricated, and one which is capable of ready and convenient repair or substitution of parts at all times.

In the accompanying drawings illustrating my present invention,

Figure 1 is a vertical longitudinal section taken through one of the cylinders of the motor.

Figure 2 is a sectional side view of the complete motor taken substantially on line 2—2 of Figure 1, and

Figure 3 is a perspective view of the valve box and the valve operating connections.

Referring now to these figures, my invention resides in a motor consisting of a plurality of cylinders 10, each of which is mounted upon supports 11 and is open at its opposite ends for the reception of opposed pistons 12, the pitmen 13 of which project outwardly beyond the cylinder ends.

Beneath the series of cylinders constituting the motor is a crank shaft 14 having a pulley 15 at one end, as seen in Figure 2, from which power may be taken by means of a belt 16, and provided with pairs of cranks 17 beneath each of the cylinders 10, from which extend pitmen 18.

The pitmen 18 just above referred to extend at their free ends beyond and beneath the open ends of the cylinders 10 and are pivotally connected at 19 to the lower ends of levers 20, the latter of which are similarly connected at their upper ends at 21 to supporting arms 22, either secured to or integral with the opposite ends of the cylinders 10 and preferably connected in a series

throughout the motor by means of tie rods 23, as seen in both of the figures.

To the levers 20 at points intermediate the ends thereof are pivotally connected the outer ends of the pitmen 13 of the pistons 12 so that as the pistons are forced apart in operation by the introduction of fluid between them, the power thus developed is transmitted through the pitmen 13, levers 20 and pitmen 18 to the crank shaft 14, from which it is in turn delivered by any suitable connections to the point or points of consumption.

The introduction of working fluid into and its removal from each of the cylinders 10 is accomplished in an automatic manner through the connections to be now described, which include a circular oscillatable valve 24 mounted centrally above each of the cylinders within a valve box 25, and having a short shaft or side trunnions projecting externally through bearings in the sides of said box. The box 25 is open at its lower portion opposite a central opening of the respective cylinder top so that the curved opening 26 of the oscillatable valve 24 may be turned to place the adjacent end of either the respective inlet pipe 27 or outlet pipe 28 in communication with the space within the cylinder 10 between the inner closed ends of the pistons 12.

The several inlet pipes 27 preferably radiate from a common supply pipe 29 as seen in Figure 2, which latter is controlled by a hand valve 30 so that operation of the motor may be started and stopped when desired, and it will be noted from Figure 2 that the motor consists of four cylinders in all, although the particular number may be varied.

Mounted loosely upon the shaft or trunnion of each of the valves 24 is a depending arm 31 whose free end is connected by a coil spring 32 with the free end of an upwardly projecting arm 33 secured upon the shaft or trunnion of the valve at one side of the arm 31. The arm 31 is pivotally connected adjacent its free end, as at 34, to a valve controlling slide 35 movable longitudinally along one side of the respective cylinder 10, with its outer end offset and secured in any suitable manner as at 36 to the respective piston pitman 13.

At its opposite end the valve slide 35 has an upright frame 37 provided at its

upper portion with valve actuating pins 38 which project laterally therefrom at opposite sides of the upper arm 33, which latter is limited in its movement to the space between laterally projecting pins 39 extending from the respective side of the valve box 25.

Thus as the pistons 12 move inwardly and outwardly in operation the lower arm 31 is shifted to opposite sides of the vertical plane of the axis of the valve 24 at each cylinder, and it is obvious that as the said arm is moved toward one side the pin 38 of frame 37 at the relatively opposite side will engage the upper arm 33 and, overcoming its inertia, will shift the same slightly to a sufficient extent so that the spring 32, already upon the relatively opposite side of the axis of the valve by virtue of movement of arm 31, will reverse the position of the valve with a quick, snappy movement in order that speed of movement will attend the reversal of the valve. During reverse movement arm 31 carries the lower end of the spring to the opposite side of the valve axis, and the same operation is repeated so that the valve is automatically controlled at the limits of stroke of the pistons 12 to accord with the proper inlet of operating fluid thereto and the exhaust of fluid therefrom.

It is obvious from the foregoing that by virtue of the simplicity of the moving parts and their exposure almost without exception to full view during operation, it will be a simple matter to effect any changes,

adjustments or repairs as they become either necessary or desirable in use, and it is further obvious that the parts may be readily lubricated and will bring about effective results.

I claim:

In a hydraulic motor, a valve box having intake and exhaust openings, a valve rotatable in said valve box and having a fluid opening for communication with said valve box openings, a valve operating shaft projecting from said valve, an arm secured to and projecting upwardly from the valve shaft, an arm loosely mounted on the valve shaft and depending therefrom, a spring connecting the free ends of said arms, a piston actuated valve slide movable below said valve box, said valve slide being pivotally connected adjacent one end to the lower end of the loose valve arm, and an inverted U-shaped frame carried by the said end of the slide and upstanding alongside the valve box, said frame having laterally projecting pins positioned at relatively opposite sides of the first mentioned valve arm to engage and shift the latter from intake to exhaust position and vice versa, and said valve box having spaced laterally projecting pins to receive the said valve arm thereagainst and form stops for said valve arm in the intake and exhaust positions.

RUBÉN RIVERA.

Witnesses:

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