No. 840,886. PATENTED JAN. 8, 1907.

C. L. WILKINS.

FLUID MOTOR.

APPLICATION FILED JAN. 24, 1906.

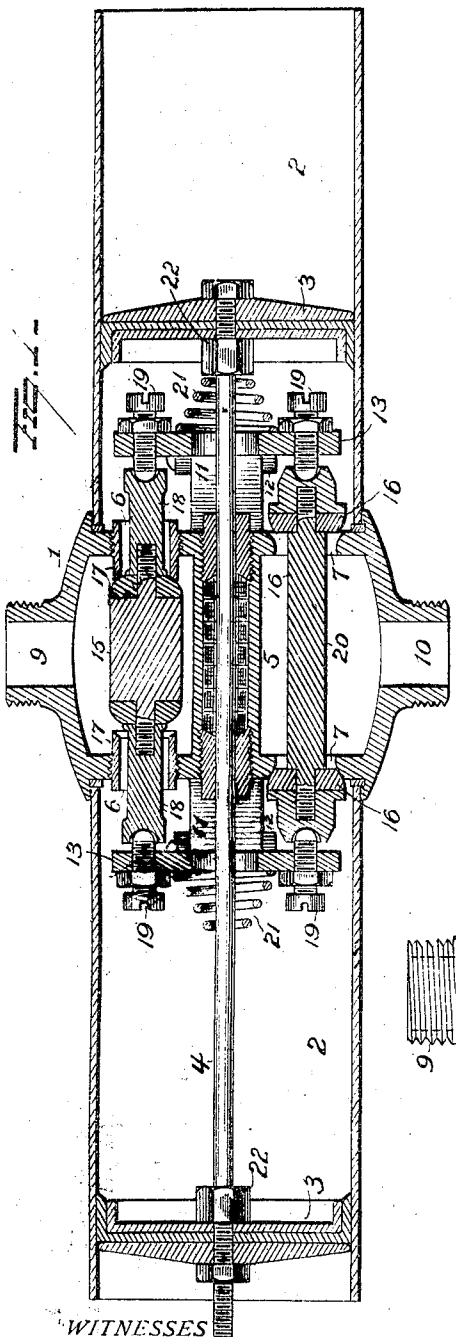


Fig. 1.

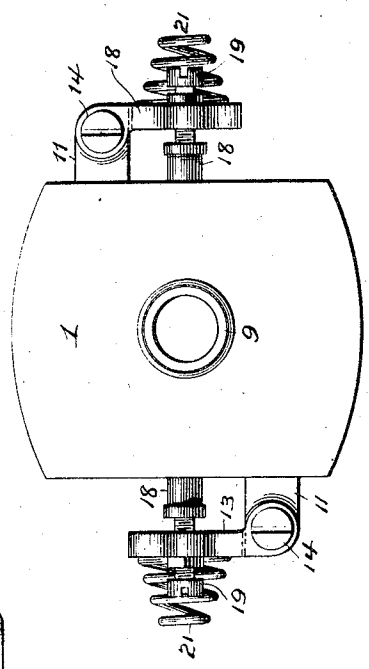


Fig. 2.

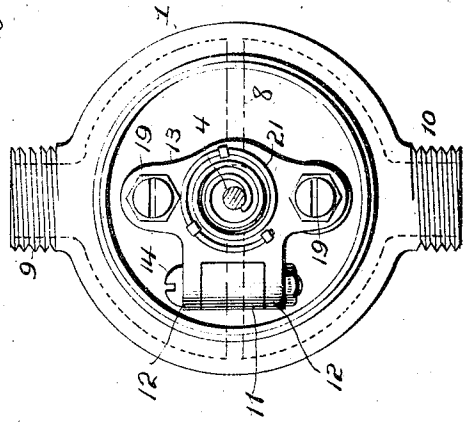


Fig. 3.

WITNESSES

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CHARLES L. WILKINS, OF COLUMBUS, OHIO, ASSIGNOR TO THE OHIO PUMP AND BRASS COMPANY, OF COLUMBUS, OHIO.

FLUID-MOTOR.

No. 840,886. Specification of Letters Patent. Patented Jan. 8, 1907.

Application filed January 24, 1906. Serial No. 297,663.

To all whom it may concern:

Be it known that I, CHARLES L. WILKINS, a resident of Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Fluid-Motors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in fluid-motors, the object of the invention being to provide an improved construction and arrangement of valves, improved adjustable valve-seats, and improved frames or yokes supporting the valves to move them without subjecting them to frictional contact and consequent wear.

With these and other objects in view the invention consists in certain novel features of construction and combinations and arrangements of parts as will be more fully hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in longitudinal section illustrating my improvements. Fig. 2 is a top plan view of the valve-chamber, and Fig. 3 is an end view thereof.

1 represents a central valve-chamber, into opposite ends of which cylinders 2 2 are screwed and packed tight. A piston 3 is located in each cylinder, and both pistons 3 are secured upon the same rod 4, which latter is movable through a central sleeve 5 in a horizontal partition 8 in chamber 1, and said sleeve contains suitable packing, as shown.

The valve-chamber 1 above its central partition is provided at opposite points in its ends with inlet-ports 6, directing the motive fluid into cylinders 2 2, and below the partition the chamber is provided at opposite points in its ends with outlet or exhaust ports 7 for directing the fluid from cylinders 2 2 into the lower portion of chamber 1, and an inlet 9 is located in the top of chamber 1 and an exhaust-port 10 in the bottom thereof.

On both ends of chamber 1 lugs 11 are located and have pivotally secured thereto the bifurcated side extensions 12 of yokes or plates 13, screws or pivot-pins 14 being secured in alined openings in the yokes or plates and lugs. These "yokes," as they will be hereinafter termed, carry at their ends screws 19, the upper pair of screws engaging sockets in the ends of an inlet-valve 15, and the lower screws engage sockets in the ends of an outlet or exhaust valve 16, the construction and operation of which valves will now be pointed out.

In the inlet-ports 6 externally-screw-threaded sleeves 17 are screwed and are provided at their inner ends with internally-beveled seats for the valve 15, and by screwing these sleeves 17 in or out the valve-seats can be adjusted to suit conditions and can be removed and replaced should occasion require. The main portion of valve 15 is located in chamber 1 between seats or sleeves 17 and has contracted end extensions 18 projected through the sleeves 17 and engaged by the screws 19, and it will be seen that as the only support of this valve 15 is the screws 19 and yokes 13 it will have no frictional contact whatever with sleeves or seats 17 when the valve is shifted, and hence is not subjected to any wear.

The main portions of valve 16 are in cylinders 2 2 and are connected by a contracted bar or rod 20 of sufficiently small diameter to prevent any contact with the walls of exhaust-ports 7, and hence wear due to the sliding of the valve is entirely obviated.

To the outer faces of yokes 13 helical springs 21 are secured and located around the piston-rod and in the path of bumper-nuts 22 thereon, so as to cushion the shifting of the valves.

By reference to Fig. 3 it will be seen that the inner hinged edges of the yokes 13 are spaced but slightly from the flat faces of lugs 11, and as said faces are elongated and parallel, as shown by the dotted lines, the yokes are permitted but a slight pivotal or swinging movement, the length of movement being less than the depth of the sockets in the ends of the valves receiving screws 19, hence preventing any possibility of accidental removal of the screws from the sockets. In other words, the valves require but a slight movement to shift them, and this is all the movement allowed yokes 13, and as the screws 19 project into the ends of the valve-stems a greater distance than double the length of movement permitted the yokes, even though both yokes be swung away from the central chamber, the screws will still support the valves.

The operation of my improvements is as

follows: With the parts as shown the motive fluid, entering port 9, flows through the left-hand inlet-port 6 into the left-hand cylinder 2 to drive the piston 3 therein outward and draw in the piston 3 in the right-hand cylinder to force out the fluid from this cylinder through exhaust-ports 7 and 10. When piston 3 in right-hand cylinder 2 reaches a position to bring its bumper-nut 22 into contact with the spring 21, it compresses the spring until the resistance from motive pressure on the opposite ends of valves 15 and 16 is overcome, when yokes 13 will be swung to carry the valves 15 and 16 to their reverse positions to open the right-hand inlet-port 6 and left-hand exhaust-port 7 and reverse the flow of the motive fluid.

Water, steam, compressed air, or other fluid may be employed to drive the motor, and hence I consider myself at liberty to employ any fluid for the purpose, and I do not restrict myself to the precise details set forth, but consider myself at liberty to make such slight changes and alterations as fairly fall within the spirit and scope of my invention.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a fluid-motor, the combination with cylinders arranged in tandem, a valve-chamber between them, pistons in the cylinders, and a rod secured to both pistons and extending through the valve-chamber, of hinged yokes on the valve-chamber, inlet and exhaust valves supported solely by said yokes and shifted thereby when the yokes are moved by the movement of the pistons.

2. In a fluid-motor, the combination with cylinders arranged in tandem, a valve-chamber between them, pistons in the cylinders, and a rod secured to both pistons and extending through the valve-chamber, of inlet and exhaust valves in the valve-chamber, hinged yokes supporting said valves, springs secured to said yokes, and means on the rod to engage the springs and throw the yokes and valves.

3. In a fluid-motor, the combination with cylinders arranged in tandem, a valve-chamber between them having a central horizontal partition, pistons in the cylinders, and a rod secured to both pistons and extending through the valve-chamber, of an inlet-valve in the valve-chamber above the partition, an exhaust-valve in the valve-chamber below the partition, hinged yokes supporting both valves, and means on the rod for moving the yokes.

4. In a fluid-motor, the combination with cylinders arranged in tandem, a valve-chamber between them having a central horizontal partition, pistons in the cylinders and a rod secured to both pistons and extending through the valve-chamber, of an inlet-valve in the valve-chamber above the partition, an exhaust-valve in the chamber below the partition, inlet and exhaust ports in both ends of the valve-chamber, adjustable seats in the inlet-ports, and hinged yokes on the ends of the valve-chamber affording the sole support for the valves.

5. In a fluid-motor, the combination with a valve-chamber having ports in its ends, of sleeves screwed into the ports and constituting adjustable valve-seats, a valve between the ports having contracted extensions projecting through the sleeves but out of contact therewith, swinging yokes, and screws thereon engaging the ends of the valve extensions and supporting the valve.

6. The combination with a valve-chamber having a horizontal partition therein and an inlet at its top and an exhaust at its bottom, of an inlet-valve in the upper portion of the chamber to alternately close and open ports in the ends of the chamber, an exhaust-valve in the lower portion of the chamber to alternately open and close ports in the ends of the chamber, yokes hinged to the ends of the chamber, screws in said yokes engaging the ends of the valves and supporting them, and springs secured to said yokes to receive the buffing means to move the yokes and valves.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

CHARLES L. WILKINS.

Witnesses:
R. J. SCOTHORN,
D. L. DAVIES.