

R. S. CARR.
VALVE OPERATING MECHANISM.
APPLICATION FILED AUG. 27, 1908.

960,816.

Patented June 7, 1910.

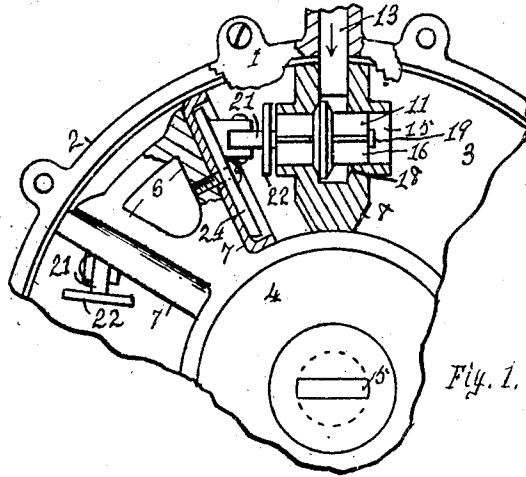


Fig. 1.

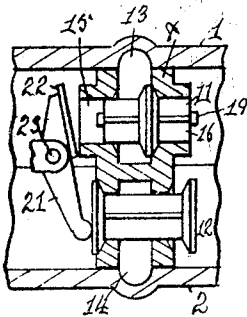


Fig. 4.

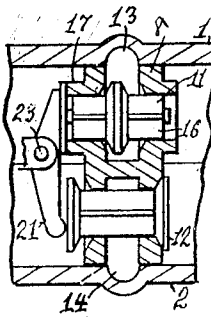


Fig. 3.

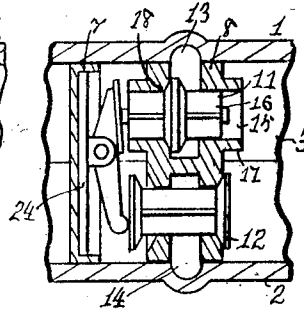


Fig. 2.

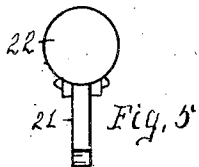


Fig. 5.

Witnesses

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VALVE-OPERATING MECHANISM.

960,816.

Specification of Letters Patent. Patented June 7, 1910.

Application filed August 27, 1908. Serial No. 450,436.

To all whom it may concern:

Be it known that I, ROBERT S. CARR, a citizen of the United States, residing at Oxford, Ohio, have invented a new and useful Improvement in Valve-Operating Mechanism, of which the following is a specification.

My invention relates to valve operating mechanism adapted to hydraulic motors and the objects of my improvements are to provide means for utilizing the pressure of the water shifting for the valve after it is unseated; to provide means for closing the inlet port during the unseating of the valve; to provide means for simultaneously closing the inlet port and unseating the valve; to provide means for unseating and for shifting the valves of a hydraulic motor without the necessity of using a spring or other elastic or resilient member, and to provide such form of construction and assemblage of parts as to secure the greatest simplicity and durability together with facility of operation and efficiency of action.

These objects are attained in the following described manner as illustrated in the accompanying drawings, in which—

Figure 1 is a plan with parts broken away and parts in section of an alternating rotative hydraulic motor embodying my improvements; Figs. 2, 3 and 4, show the valves and shifting lever in respective successive positions of shifting; Fig. 5, a front elevation of the shifting lever.

In the drawings, 1 and 2 represent separable members of the casing of an alternating rotative hydraulic motor, 3 an annular cylinder or chamber therein, 4 the piston journaled between the said members of the casing and secured to the axial shaft 5. Said piston is formed with arms 6 whereon the respective cup packings 7 movable within the cylinder are secured. The valve housing 8 forms a partition across the cylinder and is provided with the usual inlet and discharge valves 11 and 12 which communicate with the respective inlet and discharge passages 13 and 14. Pressure chambers 15 are formed around the inlet valve stems 16 by the extension of the walls 17 of the inlet ports 18 beyond the ends thereof. Bosses 19 formed on the ends of stems 16 are alternately extended a short distance beyond the corresponding walls 17 by the shifting movement of valve 11. Shifting levers 21 each formed with a plate or closure 22 for the

corresponding chamber 15 are fulcrumed at a point 23 above the intermediate point of their length on the plates 24 which are secured to the respective cup packings 7.

In operation, the cup packings are movable with the levers alternately into contact with the corresponding ends of the valves. The closures contact with the bosses on the inlet valve and the longer lower portion of the levers with the ends of the discharge valve as shown in Fig. 2. The greater exertion of the shifting lever on the inlet valve unseats it from the left-hand port, as shown in Fig. 3, but the flow of water thereunder and through the said left-hand port or chamber is momentarily prevented by the closure. The further shifting of the valve to close the right-hand port (Fig. 4) is apparently due to the suction effect of the water acting upon the left-hand portion of the valve, during the remainder of the period of flow through the right-hand port. Upon the seating of the valve at the right-hand port, the water issues through the left-hand port and forces the closure with the top of the lever in an outward direction for both unseating and shifting the discharge valve with the lower end of the lever, as shown in Fig. 4. The direction of movement of the piston being thus reversed, the opposite lever is carried in contact with the opposite end of the valves for shifting them in like manner in the opposite direction, for reversing the direction of the piston whereby the alternating rotative motion thereof may be automatically maintained as long as desired.

Having fully described my improvements, what I claim as my invention and desire to secure by Letters Patent of the United States is—

1. A motor comprising conjointly operating inlet and discharge valves, said inlet valve being provided with a port, and a movable device constructed and arranged for obstructing said port and for unseating the discharge valve.

2. The combination with a valve, of a movable device for starting it off its seat to admit behind it a motive fluid and for simultaneously obstructing the port behind the valve to enable said fluid to complete the movement of the valve.

3. A motor comprising conjointly operating inlet and discharge valves, said inlet valve being provided with a port, and a

movable device constructed and arranged for obstructing said port and for unseating said valves.

4. A motor comprising an inlet valve provided with a port, a movable device constructed and arranged for unseating said valve and for obstructing the port thereof, and means for supporting said device in registration with said valve.

5. In a hydraulic motor, the combination with an inlet valve, of a movable device constructed and arranged for unseating said valve and for temporarily inclosing the inlet valve stem within the corresponding inlet port.

6. In a hydraulic motor, the combination of an inlet valve and a movable device for both unseating the valve and for obstructing the port thereof.

7. In a hydraulic motor having an inlet port whose walls are extended, an inlet valve provided with a stem substantially co-terminus with said walls when said valve is in closed position, and movable means for unseating said valve and for closing the chamber formed by said extended walls.

8. A hydraulic motor having in combination an alternately operating inlet valve and ports, an alternately operating discharge valve, and a movable device constructed and arranged to contact with and unseat said valves and to obstruct the corresponding port of the inlet valve.

9. In a hydraulic motor, the combination with a member provided with an inlet valve and with a discharge valve, of a fulcrumed lever constructed and arranged for successively opening said valves, said member and said lever being movable bodily the one in relation to the other.

10. In a hydraulic motor, a member carrying conjointly operating inlet and discharge valves, an obstruction for temporarily closing the port of the inlet valve and simultaneously starting the inlet valve from its seat, and means operating by the withdrawal of said obstruction for opening said discharge valve.

11. In a hydraulic motor, a member carrying conjointly operating inlet and discharge valves, a device carrying an obstruction for the port of said inlet valve and adapted to operate upon the discharge valve to close it on the withdrawal of the obstruction from said port, said member and said device being bodily movable relative to each other.

12. In a hydraulic motor, the combination of inlet and discharge valves, and a movable member for obstructing the inlet port and

unseating the inlet valve and for unseating and shifting the discharge valve.

13. In a hydraulic motor, the combination of inlet and discharge valves, and a movable device arranged for unseating the inlet valve, obstructing the inlet port and for shifting the discharge valve.

14. A motor comprising conjointly operating inlet and discharge valves, said inlet valve being provided with a port, a movable device constructed and arranged for contacting with and unseating both of said valves and for obstructing said port, and means for supporting said device in registration with the valves.

15. In a hydraulic motor, the combination with inlet and discharge valves, of means arranged to contact with the discharge valve for closing the inlet port and for unseating the inlet valve and whereby the discharge valve is shifted by said means under the water pressure admitted within the port by the said unseated valve.

16. A motor comprising an inlet valve provided with a port, a discharge valve, a fulcrumed device constructed and arranged for unseating the inlet valve and obstructing said port by contacting with the discharge valve, and means for supporting said device.

17. A motor comprising an inlet valve provided with a port, a discharge valve, a fulcrumed device constructed and arranged for unseating the inlet valve and obstructing said port and for unseating the discharge valve, and means movable in relation to the valves for supporting said device in registration therewith.

18. In a hydraulic motor, the combination of inlet and discharge valves, and means constructed and arranged to be directly actuated by the water entering at the inlet valve for shifting the outlet valve.

19. A hydraulic motor comprising inlet and discharge valves, a member movable in relation thereto and a non-elastic device fulcrumed on said member for successively unseating said valves.

20. In a hydraulic motor, the combination with the cylinder and the valve chambers, of inlet and discharge valves, a member movable bodily in relation to the valves, and a non-elastic device movably supported on said member and arranged to contact with and unseat said valves in succession.

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Witnesses:

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