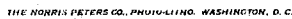


Patented July 25, 1916.



UNITED STATES PATENT OFFICE.

JOHN E. W. FOGAL, OF QUINCY, ILLINOIS.

VALVE-OPERATING MECHANISM FOR MOTORS.

1,192,293.

Specification of Letters Patent.

Patented July 25, 1916.

Application filed November 19, 1914, Serial No. 873,039. Renewed April 24, 1916. Serial No. 93,272.

To all whom it may concern:

Be it known that I, JOHN E. W. FOGAL, a citizen of the United States, residing at Quincy, in the county of Adams and State of Illinois, have invented a new and useful Valve-Operating Mechanism for Motors, of which the following is a specification.

The present invention relates to improvements in valve operating mechanisms for elevator doors, the same relating more particularly to the motor and control mechanism for actuating the door controlling bar as set forth in my U. S. Letters Patent No. 865,335, granted September 3, 1907, one object of the present invention, being the provision of a hydraulically operated means for causing the elevation or lowering of such bar, the action of which is manually controlled from a position within the elevator car or cage so that one valve may be opened to permit of the introduction of water within the cylinder to elevate the plunger while another valve is operated to permit of the draining of the cylinder, the feeding valve being closed.

A further object of the present invention is the provision of a valve controlling mechanism by means of which the supply and drain valves are readily controlled by a manually operated mechanism to insure the proper operation of the bar actuating plunger there being further provided an automatic means controlled by the movement of the cross head and plunger actuating means for operating the valves to closed position.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings—Figure 1 is a side elevation of the complete motor, portions of the manually controlled means being illustrated. Fig. 2 is a view taken from the right as shown in Fig. 1, a portion of the hydraulic cylinder being shown in section.

Referring to the drawings, the numeral 1 designates the cylinder of a hydraulic motor of the plunger type, said cylinder having mounted therein for reciprocation, the

plunger 2 slidable through the stuffing box 3, the upper end of the plunger 2 being connected with the rack bar 4, the same being provided with the teeth 5 on one side. The upper end of said bar is guided in the strap 6 of the cross bar 6', the teeth 5 being in mesh with the gear 7 fixed upon the shaft 8. Mounted upon this shaft and rotatable therewith, is the cable carrying drum or member 9 which operates the cable 48 which in turn controls and operates the vertical reciprocatory bar 50 as particularly set forth in the before mentioned Letters Patent.

A frame 10 is attached to the plunger at its connection with the rack bar 4 and is provided with the upwardly curved and outwardly extended arms 11 and 11' provided with the respective guiding sleeves 12 and 12' which fit upon the supporting rods 13 and 13' which in turn carry and connect the bar 6' relatively to the cylinder 1. Thus it will be seen that the cross bar 6' is held in fixed relation to the cylinder 1 at all times and that the shaft 8 is merely rotated due to the reciprocation of the piston 2 to impart the necessary movement to the cable 48.

In order to provide a means for properly controlling the entrance or the drain from the cylinder 1, a pipe or connection 24 which constitutes the induction and eduction pipe of the cylinder 1 is connected to the cylinder 1 intermediate of its ends or at any point so that the water admitted under pressure will pass below to impart an upward movement to the plunger 2 and be released therefrom to flow in the opposite direction through the pipe 24 to permit the plunger 2 to lower.

The pipe 24 is provided with the oppositely disposed branches 25 and 26, each one of which has connected therein, its respective valve casing 27 or 28, the valve casing 27 being the valve for controlling the admission of water to the cylinder 1 while the valve 28 is the valve for controlling the drain therefrom. In other words, the valve 28 is the draining valve for the cylinder while the valve 27 is the supply valve therefor.

Connected to the stem of the valve 27 is a bar or lever 29, which is perforated to permit of the adjustable connection thereto of the lower end of the supply valve closing rod 20, said rod 20 being adjustably connected through the set screw 18 to the aper-

tured lug 15 carried by the sleeve 14 which
 in turn is slidably mounted upon the rod 13
 in the path of the sleeve 12 of the arm 11 as
 the same is moved upwardly to rotate the
 5 shaft 8. The opposite end of the lever 29
 is provided with the apertured projection 31
 through which is slidably mounted the rod
 32 which in turn has disposed thereupon,
 the two adjustable blocks 33 and 34 and a
 10 coiled spring 35. As clearly shown in Fig.
 1, the spring 35 is disposed to be engaged at
 its lower end by the adjustable block 34 and
 at its upper end bears against the underside
 of the projection 31, the block 33 limiting
 15 the position of the projection 31 relatively
 to the rod so that the spring 35 holds the
 projection 31 against the block 33. Thus it
 will be seen that the spring acts as the trans-
 mitting means to operate the lever 29 as the
 20 rod 32 is elevated to open the supply valve 27.

The draining valve 28, has attached to its
 stem, the lever or bar 36, which is perforated
 for adjustable engagement therewith of the
 lower end of the drain valve closing rod 21,
 25 said rod 21 having its upper end adjustably
 connected by means of the set screw 16 to the
 apertured lug 17 of the slidable sleeve 15,
 which in turn is mounted upon the rod 13
 at a point near the upper end of the cylin-
 30 der. This sleeve 15 is adapted to be moved
 downwardly by the sleeve 12 at the lower-
 most stroke of the piston 2, to thus auto-
 matically cut off the drain valve 28. Thus
 the valve 27 will be cut off automatically
 35 when the piston 2 has reached its highest
 point through the engagement of the sleeve
 12 with the sleeve 14, and the valve 28 will
 be cut off by the piston in its lowest position
 due to the engagement of the sleeve 12 with
 40 the sleeve 15.

In order to open the valve 28 manually,
 the end of the lever 36 opposite to the rod 21
 is provided with the apertured lug or pro-
 45 jection 38 in which is slidably mounted the
 rod 39, said rod 39 having upon its lower
 end, the adjustable limiting block 40 and
 mounted at a point above the projection 38
 is the adjustable limiting block 41. A coiled
 50 spring 42 is interposed between the block 41
 and the projection 38 and forms a resilient
 transmitting means between the rod 39 and
 the lever 36.

Both of the rods 32 and 39 are connected
 at their upper end to the pin P which is con-
 55 nected to the disk 43 upon the shaft 44.
 The shaft 44 is journaled in any suitable
 manner and is provided with the cable re-
 ceiving pulley 45. The operating cable 46
 is disposed in the elevator shaft and passes
 60 through the car in ready access to the opera-
 tor for controlling the actuation of the shaft
 44 and consequently the opening of the re-
 spective valves 27 and 28. This cable 46
 which as illustrated in Fig. 1 is guided at
 65 its lowermost point around the pulley 47,

and at its upper end is guided over a similar
 pulley not illustrated.

It will thus be seen when the pulley 45 is
 to elevate both rods 32 and 39, that the rod
 39 will slide in the projection 38 and not
 70 affect the lever 36, while the spring 35 will
 transmit movement to the lever 29 and open
 the supply valve 27. Thus water will be ad-
 mitted to the cylinder to elevate the plun-
 ger 2, which in turn elevates the arm 11 and
 75 bar 4, rotating the pulley 9 and pulling
 upon the cable 48. When the sleeve 12 en-
 gages the block 14, the rod 20 is pulled upon
 and it in turn pulls up the lever 29 and
 compresses the spring 35, the valve 27 being
 80 closed.

When the operator shifts the rope 46 the
 reverse movement of the rods 32 and 39 takes
 place and the spring 35 assumes the position
 as shown in Fig. 1 while the spring 42
 85 transmits motion through the projection 38
 to the lever 36 opening the drain valve 28.
 Thus the plunger 2 descends and rotates the
 pulley 9 to close the gate while the sleeve 12
 at its lowermost position engages the sleeve
 90 15 and pushes the rod 21 downwardly to
 move the lever 36 to the position as shown
 in Fig. 1, with the valve 28 closed and with
 spring 42 compressed. Thus the rods 32
 and 39 open the valves 27 and 28, and the
 95 rods 20 and 21 close them.

It will thus be seen that as the shaft 8 is
 rotated, the cable 48 will be also operated
 to impart the desired movement to the ver-
 100 tically movable bar shown in the before
 mentioned patent.

By means of the rods 32 and 39 the re-
 spective valves are manually opened, both
 being automatically closed by the plunger
 2, through the arm 11 and the rods 20 and
 105 21.

What is claimed is:—

1. An elevator door or gate operating
 motor, including a cylinder provided with a
 port, a plunger mounted therein, a power
 110 transmitting means connected to the plun-
 ger, a pipe connected to the cylinder and in
 communication with the port, a supply
 valve and a drain valve connected to said
 pipe, two levers one connected to each valve,
 115 two rods, one slidably connected to each le-
 ver, a spring mounted upon each rod and
 forming a resilient connection between the
 rod and its lever, and manually controlled
 means connected to both rods, whereby the
 120 rods are actuated to selectively open one
 valve at a time.

2. An elevator door or gate operating
 motor, including a cylinder provided with
 a port, a plunger mounted therein, a power
 125 transmitting means connected to the plun-
 ger, a pipe connected to the cylinder and in
 communication with the port, a supply
 valve and a drain valve connected to said
 pipe, two levers, one connected to each valve,
 130

two rods, one slidably connected to each lever, a spring mounted upon each rod and forming a resilient connection between the rod and its lever, manually controlled means
5 connected to both rods, whereby the rods are actuated to selectively open the valves, and means operably connected to both levers of the valves and in the path of the plunger, whereby the supply valve is closed at one
10 extreme movement of the plunger while the

drain valve is closed at the other extreme movement of the plunger.

In testimony that I claim the foregoing as my own, I have hereunto affixed my signature in the presence of two witnesses.

JOHN E. W. FOGAL.

Witnesses:

L. M. DUNCAN,

HENRY D. FLACK.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."