

D. P. MOORE.
HYDRAULIC OPERATOR FOR GATE VALVES.
APPLICATION FILED SEPT. 24, 1908.

927,422.

Patented July 6, 1909.

3 SHEETS—SHEET 1.

Fig. 1.

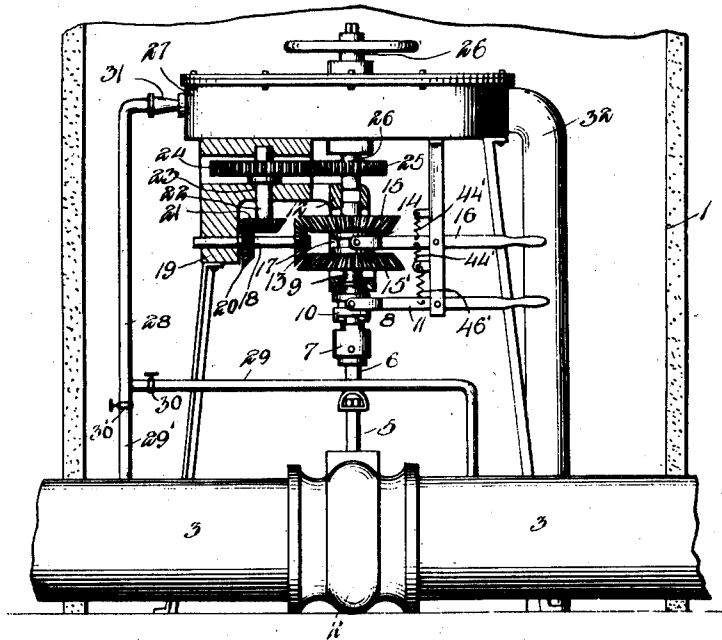
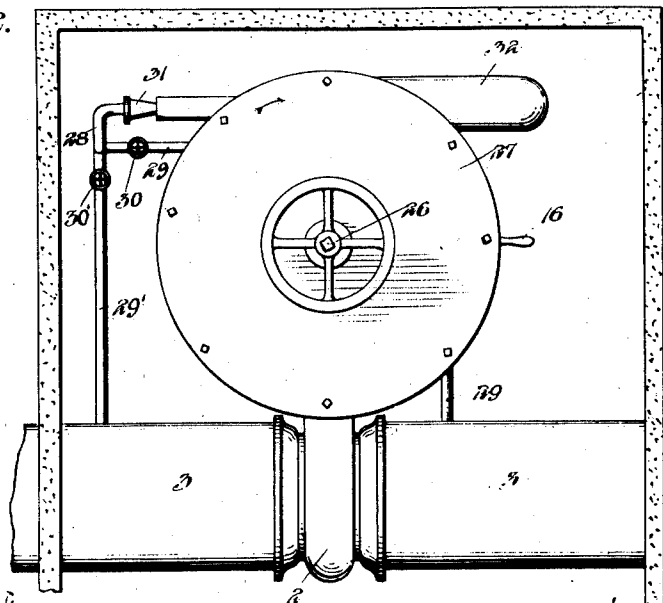


Fig. 2.



Witnesses
G. M. Spring
H. L. Wilson.

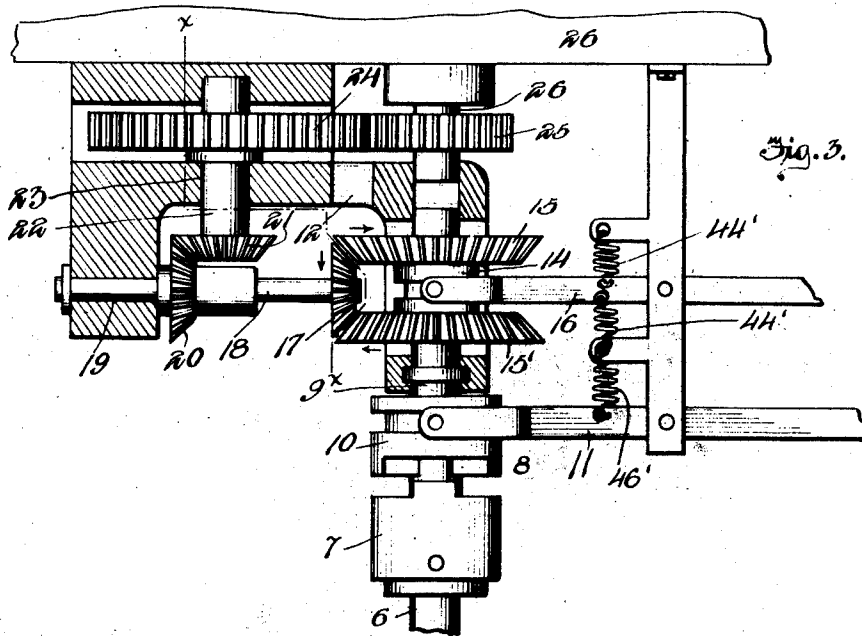
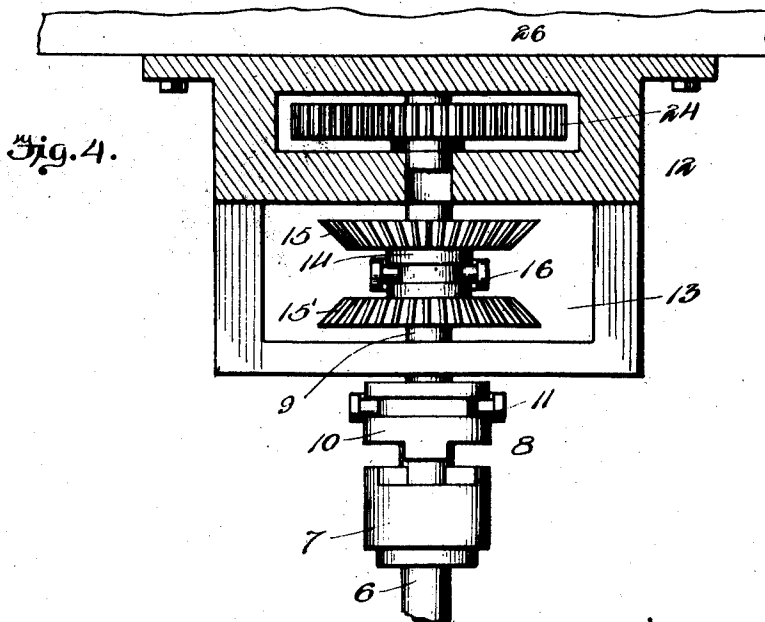
Inventor
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H. L. Wilson.

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David P. Moore.

UNITED STATES PATENT OFFICE.

DAVID P. MOORE, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR TO HIMSELF AND CARROLL BEALE, OF WASHINGTON, DISTRICT OF COLUMBIA, AND EDWIN A. LERCH, OF BALTIMORE, MARYLAND.

HYDRAULIC OPERATOR FOR GATE-VALVES.

No. 927,422.

Specification of Letters Patent.

Patented July 6, 1909.

Application filed September 24, 1908. Serial No. 454,515.

To all whom it may concern:

Be it known that I, DAVID P. MOORE, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Hydraulic Operators for Gate-Valves, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in hydraulic operators for gate valves, the object of this invention, being the provision of a single way rotary water motor, which is operably connected so as to receive its operating fluid from the pressure side of the valve, and convey motion to the valve operating mechanism to open and close said valve, a series of clutches being provided to accomplish this result, and convert the continuous movement of the motor in a single direction into motion to operate the valve in two directions, that is to close or open.

To clearly illustrate my invention, attention is invited to the accompanying drawings, in which:—

Figure 1 is an elevation of a single way rotatable horizontal water motor connected in operable relation to a horizontal gate valve. Fig. 2 is a top plan thereof. Fig. 3 is an enlarged detail view of the clutch mechanism, as shown in Fig. 1. Fig. 4 a view on line *x-x*, Fig. 3 looking toward the clutches. Fig. 5 shows a vertical single way rotating water motor installed, and Fig. 6 is a top plan view thereof.

Referring to the drawings:—the numeral 1 designates the vault, in which is mounted the horizontal gate valve and its casing 2, which is connected to control the water main 3. This valve, as usual, is provided with the exterior operating mechanism 4, embodying the key-shaft 5, to which, I removably connect the short key 6, which is connected to the lower member 7 of the flexible jointed clutch 8, the shaft 9, having a ball-and-socket connection, not shown, in the member 7, and passing upwardly through the sliding keyed member 10, of the clutch which is manually controlled through the medium of the lever 11. This shaft 9, is journaled in the casting 12, in whose open portion 13, and upon the shaft 9 is slidably keyed the collar 14, carrying the two oppositely beveled gears or pinions 15 and 15', a lever 16

being employed to slide the collar and consequently the gears, so that one at a time will mesh with and be engaged by the small bevel pinion or gear 17, which is carried upon the horizontal shaft 18. This horizontal shaft is journaled in the casting at 19, and carries the bevel gear or pinion 20, which meshes at all times with the bevel gear or pinion 21, carried upon the lower end of the vertical shaft 22, which is journaled in the casting at 23, and parallel with the shaft 9. This shaft has keyed thereon the large gear wheel 24, which at all times meshes with the small gear or pinion 25, which is keyed upon the lower end of the motor's vertical shaft 26, the motor being mounted in the casing 27, and capable of a rotary motion in only one way. This is by reason of the water conducting pipe 28, which has the two branches 29 and 29', each leading to its side of the valve and attached to the main, so that pressure may always be had from the pressure side of the valve. To admit pressure through the pipe 28, one of the valves 30 or 30' is operated, and water is allowed to enter the pipe 28, the nozzle 31 of the motor, where it acts upon the motor wheel, not shown, and finally exhausts or discharges from the casing into the discharge pipe 32, which leads to a drain in the vault. This constitutes the mechanism for a single way horizontal water motor.

By referring to Figs. 5 and 6, it will be seen that I employ the vertical single way rotary water motor 33, having the water supply pipe 34 with its branches 35 and 35', the motor's nozzle 36, and discharge 37. The branches 35 and 35', are provided with the manually operated valves 30 and 30', respectively, thus allowing control of the flow of water through either of the branches to the motor. In this instance the motor has a horizontal shaft 26', instead of a vertical shaft, and the casting or frame 12', is attached to and carried by the inner side of the motor casing instead of the bottom; and further the single bevel pinion or gear 38 is adapted to be engaged, one at a time by the two bevel gears 39 and 39', which are carried upon the collar 40, which is slidably keyed upon the vertical shaft 41, this shaft being journaled in the frame 12', and carrying upon its lower end the clutch 42, which is similar to the clutch heretofore described.

From the frame 12' depend the upper bracket 43, in which is fulcrumed the upper clutch operating lever 44, and also the lower bracket 45, in which is fulcrumed the operating lever 46 for the clutch 42.

From the foregoing description taken in connection, with the drawings, the operation of my improved hydraulic operating mechanism is readily understood, but briefly stated it is as follows:—Both clutches being "out", the water is admitted to the motor from the pressure side of the valve, the motor revolves its shaft, and consequently the bevel pinions 17 or 38. The desired one of the gears of the gear clutch is now thrown into mesh with the pinion 17 or 38, and thus the vertical shaft carrying the sliding member of the other clutch is rotated. To cause a rotary motion to be imparted to the key-shaft, the lower clutch is now operated, and motion is thus transmitted to the valve operating mechanism from the motor. When it is desired to reverse this motion, the clutches are thrown out in order, and the other of the gears of the gear clutch is thrown in, and the operation continues as above set forth.

The lever 16 or 44, as clearly shown in Figs. 1, 3 and 5, is each provided with the two coiled springs 44', both of which normally hold the lever in the position shown in Figs. 1, 3 and 5, so that either set of gears 15 and 15' or 39 and 39' is out of engagement with the gear 17 or 38, respectively, thus allowing the motor to run free without normally affecting the gears 15 and 15' or 39 and 39', respectively. The operating lever 11 or 46, is also provided with the spring 46', which automatically throws out the clutch 8 or 42 and holds it out, both of the clutches being normally "out", so that no motion from the motor is transmitted to the valve operating mechanism, until the levers 16 or 44, and 11 or 46, are manually operated and held by the operator. By this means, it makes it compulsory for the person operating the machine to stand by the same, and thus avoid damage to the machine or valve during the opening or closing of the valve.

What I claim, as new is:—

1. In combination with a water main, a valve mounted therein, operating mechanism for the valve, two pipes in communication with the water main at the respective sides of the valve and adapted to convey water from the main, a manually operated valve mounted in each of said pipes to control the flow of water from the main there-through, and a single pipe into which both of said pipes lead, of a single way rotating water motor in communication with said single pipe, whereby the water is conducted from the main to the motor through either one of the valve controlled pipes, and means for

operably connecting the motor to the valve operating mechanism to open or close the valve.

2. In combination with a water main, a valve mounted therein, operating mechanism for the valve, two pipes in communication with the water main at the respective sides of the valve and adapted to convey water from the main, a manually operated valve mounted in each of said pipes to control the flow of water from the main there-through, and a single pipe into which both of said pipes lead, of a single way rotating water motor in communication with said single pipe, whereby the water is conducted from the main to the motor through either one of the valve controlled pipes, and a clutch for operably connecting the motor with the valve operating mechanism, whereby the motor operates the valve operating mechanism to open or close the valve.

3. In combination with a water main, a valve mounted therein, operating mechanism for the valve, two pipes in communication with the water main at the respective sides of the valve and adapted to convey water from the main, a manually operated valve mounted in each of said pipes to control the flow of water from the main there-through, and a single pipe into which both of said pipes lead, of a single way rotating water motor in communication with said single pipe, whereby the water is conducted from the main to the motor through either one of the valve controlled pipes, and two clutches interposed between said motor and the valve operating mechanism, one of the clutches allowing the motor and the other clutch to run free without affecting the valve operating mechanism, or connecting the same to cause the motor to operate the valve operating mechanism, and the other clutch determining the direction of rotation of the valve operating mechanism.

4. In combination with a water main, a valve casing mounted therein, a valve in said casing, operating mechanism for the valve, and conduits for conveying water away from the main at each side of the valve casing, of a single way rotating vertical water motor mounted to one side of the valve casing, a frame carried by said motor casing and opposed to the valve operating mechanism, a vertical shaft journaled in said frame and adapted to receive motion from the water motor, and means for operably connecting said vertical shaft with the valve operating mechanism to open or close the valve, said water motor receiving its operating fluid from the main through said conduits.

5. In combination with a water main, a valve casing mounted therein, a valve in said casing, operating mechanism for the valve, two pipes in communication with the water main at the respective sides of the

valve casing and adapted to convey water
from the main, a valve to control each of said
pipes, and a single pipe into which said two
pipes lead, of a single way rotating vertical
5 water motor mounted to one side of the valve
casing and having its shaft projecting to one
side thereof above the valve operating mech-
anism, a frame connected to and carried by
the motor casing upon the same side as the
10 motor's shaft, a vertical shaft journaled in
said frame, a clutch mounted in the frame
and interposed between the motor's shaft
and the vertical shaft, said clutch controlling

the direction of rotation of the vertical shaft,
means to operate said clutch, another clutch 15
upon the lower end of the vertical shaft for
operably connecting the valve operating
mechanism with said vertical shaft, and
means for controlling said last mentioned
clutch. 20

In testimony whereof I affix my signature
in presence of two witnesses.

DAVID P. MOORE.

Witnesses:

G. M. SPRING,
A. M. PARKINS.