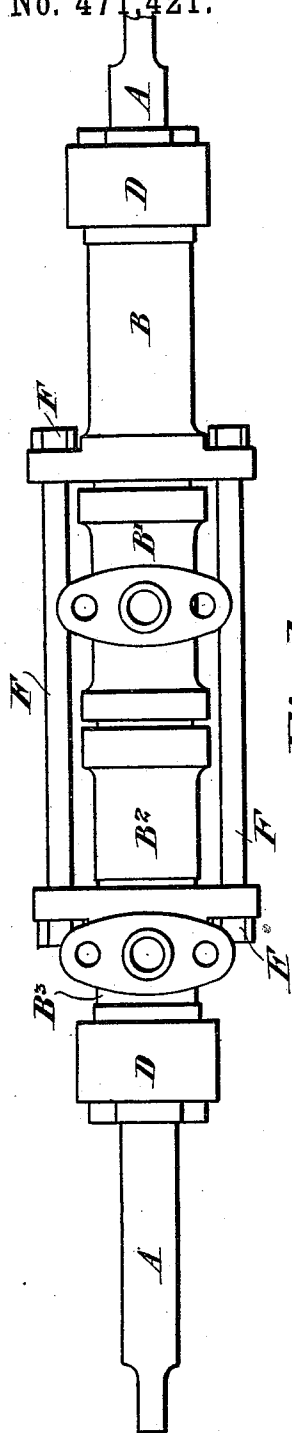


(No Model.)

H. J. GWYNNE & G. E. FOWLER.
VALVE FOR CONTROLLING THE INFLOW AND DISCHARGE OF
HYDRAULIC PRESSURE, &c.

No. 471,421.

Patented Mar. 22, 1892.



Witnesses:

E. B. Bolton
J. H. Kington

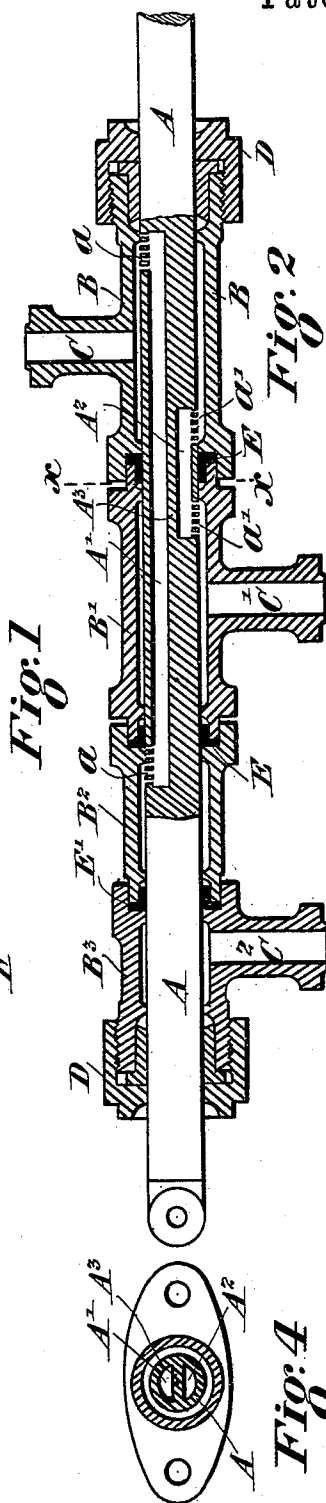


Fig. 2

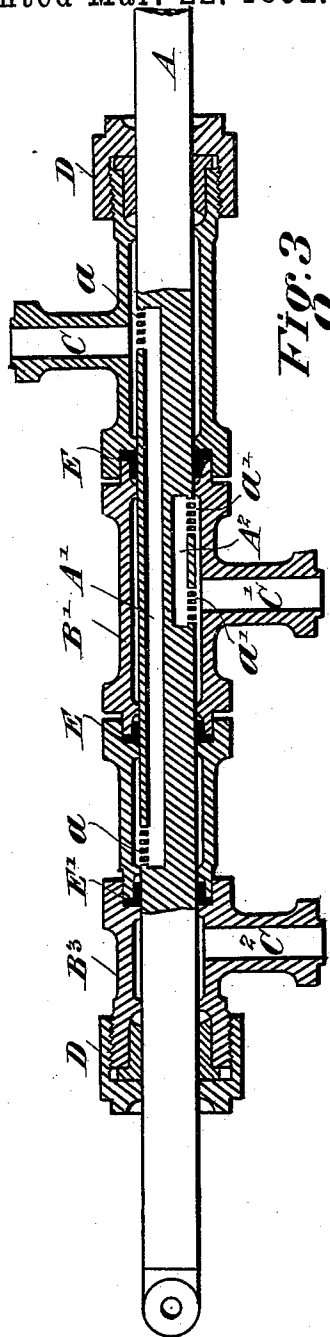


Fig. 3

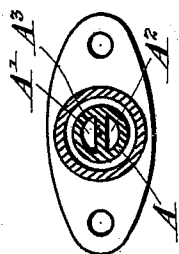


Fig. 4

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UNITED STATES PATENT OFFICE.

HUGH JAMES GWYNNE, OF SOUTH MELBOURNE, AND GEORGE EMSLIE
FOWLER, OF MELBOURNE, VICTORIA.

VALVE FOR CONTROLLING THE INFLOW AND DISCHARGE OF HYDRAULIC PRESSURE, &c.

SPECIFICATION forming part of Letters Patent No. 471,421, dated March 22, 1892.

Application filed October 10, 1891. Serial No. 408,394. (No model.) Patented in Victoria April 10, 1891, No. 8,644, and in New South Wales April 16, 1891, No. 2,925.

To all whom it may concern:

Be it known that we, HUGH JAMES GWYNNE, engineer, of Moray Street, South Melbourne, in the Colony of Victoria, and GEORGE EMSLIE FOWLER, engineer, of 325 Collins Street, Melbourne, in Victoria, as aforesaid, both subjects of the Queen of Great Britain, have invented an Improved Valve for Controlling the Inflow and Discharge of Hydraulic Pressure to and from Lift and other Cylinders, of which the following is an exact, clear, and complete specification.

The invention has been patented to us in Victoria, No. 8,644, dated April 10, 1891, and in New South Wales, No. 2,925, dated April 16, 1891.

Our device is constructed of two main parts: first, a cylindrical slide rod or valve having two distinct ports or passages in it and each port having perforations at both its ends, and, second, a casing or valve-box for such slide-rod, having three branches on it—one for receiving the hydraulic-pressure supply from main, another for connection to the lift-cylinder, and the other for leading off the discharge from cylinder. The casing is also furnished with three leathers and with end stuffing-boxes and glands through which the valve works, each end of the valve being exposed to the atmosphere and connected to the rope or medium that is operated from the cage. Our valve-rod is practically held in equilibrium by its being so constructed that the hydraulic supply at all times exerts a uniform pressure over all parts to which it is admitted.

The features of novelty in the above arrangement will be pointed out hereinafter.

The invention will be best understood by describing it by reference to the accompanying sheet of drawings, in which—

Figure 1 is a side view of it with the valve-rod in its lowermost position; and Figs. 2 and 3 are longitudinal sections through center of valve, the former showing the valve-rod in position for passing a full supply to cylinder and the latter with the valve-rod in position to cut off the supply thereto. Fig. 4 is a section on line *x x*, Fig. 2.

A is the valve-rod, having a long narrow passage or exhaust-port A' formed in it, that

communicates with exterior by small holes or perforations *a* at each of its ends.

A² is a shorter passage or supply-port also communicating with exterior by small holes or perforations *a'* at each end. These ports are separated from each other by the central metal division A³.

B, B', B², and B³ are the four parts forming the casing or valve-box. B has a branch C on it, leading to lift or other cylinders. B' has a branch C' for connection to hydraulic-pressure-supply main, and B³ has the discharge branch C² on it.

D D are screw-glands at top and bottom of valve-box for adjusting the packing around the valve-rod.

In the joint between B' and B and B' and B² are suitable recesses for packing-leathers E E, that fit closely upon valve-rod A, and it will be observed that these leathers are arranged to be pressed close upon the valve-rod by the pressure entering branch pipe C' from main.

F are bolts securing parts B, B', B², and B³ together, said bolts extending through flanges on the end chambers.

E' is a leather arranged, as shown, in a suitable recess in joint between B² and B³.

The mode of operation of the valve will be understood by the sectional drawings, Fig. 2 showing the valve in position to allow of the hydraulic pressure passing to lift-cylinder. The supply entering branch C' passes to chamber of casing B' and from thence through lower perforations *a'* to port or passage A² in valve-rod and out through upper perforations *a'* to chamber of casing B, from whence it passes to lift-cylinder through branch C. It must also be observed that the pressure within casing B has access also to casing B² by way of exhaust-port A' and perforations *a*. Consequently, as before stated, the valve is held in a state of equilibrium by the pressure being equal on both its ends. Now to cut off the supply to lift-cylinder valve-rod A is pulled down low enough for the perforations *a'* of port A² to be below bottom of chamber B or within chamber B', as shown in Fig. 3. Again, to place the valve-rod in position to allow the hydraulic pressure to discharge from lift-cyl-

under the valve-rod is lowered still farther or until the lower perforations *a* of port *A'* are within the casing *B*³, when the liquid pressure will flow thereinto from chamber *B* through exhaust-port *A'* and perforations *a*.

By constructing the valve-rod with two distinct ports or passage-ways, communicated with by small perforations, the number of holes or total area of the latter can be adjusted to a nicety, while the area at each end of both ports may be varied to suit requirements also by having small perforations, and the leathers are not so liable to be injured by the passage of the valve-rod through them. Again, should the pressure in cylinder at any time become momentarily greater than the pressure in main, by our construction of valve and arrangement of leathers it immediately exerts its force direct upon pressure in main and equalizes the pressure from cylinder, passing from chambers at top and bottom of leathers *E E* through them and into the main.

Our invention may be used for hydraulic cranes or hoists as well as lift-cylinders.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is—

1. In combination with the sliding valve, the casing therefor having an inlet-chamber *B'*, the cylinder-chamber on one side of the same and inclosing one end of the valve, the equalizing-chamber on the other side of the inlet-chamber and extending about the oppo-

site portion of the valve, the exhaust-chamber beyond the equalizing-chamber, the short inlet-port extending longitudinally through the body of the valve-rod to reach from the inlet-chamber to the cylinder-chamber, and the elongated exhaust-passage extending longitudinally through the body of the valve-rod and adapted to reach from the cylinder-chamber to the equalizing-chamber when the valve is in position to admit the fluid to the cylinder-chamber and to reach from the cylinder-chamber to the exhaust-chamber when the valve is in the other position, substantially as described.

2. In combination, the valve-rod, the casing having the cylinder-chamber, the inlet-chamber, the equalizing-chamber, and the exhaust-chamber, the said rod having the independent inlet and exhaust ports *A*² *A'* extending longitudinally therein, the said inlet-port being adapted to reach from the inlet to the cylinder-chamber, and the exhaust-port communicating in all its positions with the cylinder-chamber and connecting the same with either the equalizing-chamber or the exhaust-chamber, according to its position, substantially as described.

In witness whereof we have hereunto set our hands in presence of two witnesses.

HUGH JAMES GWYNNE.

GEORGE EMSLIE FOWLER.

Witnesses:

HENRY HOILE,

BEDLINGTON BODYCOMB.