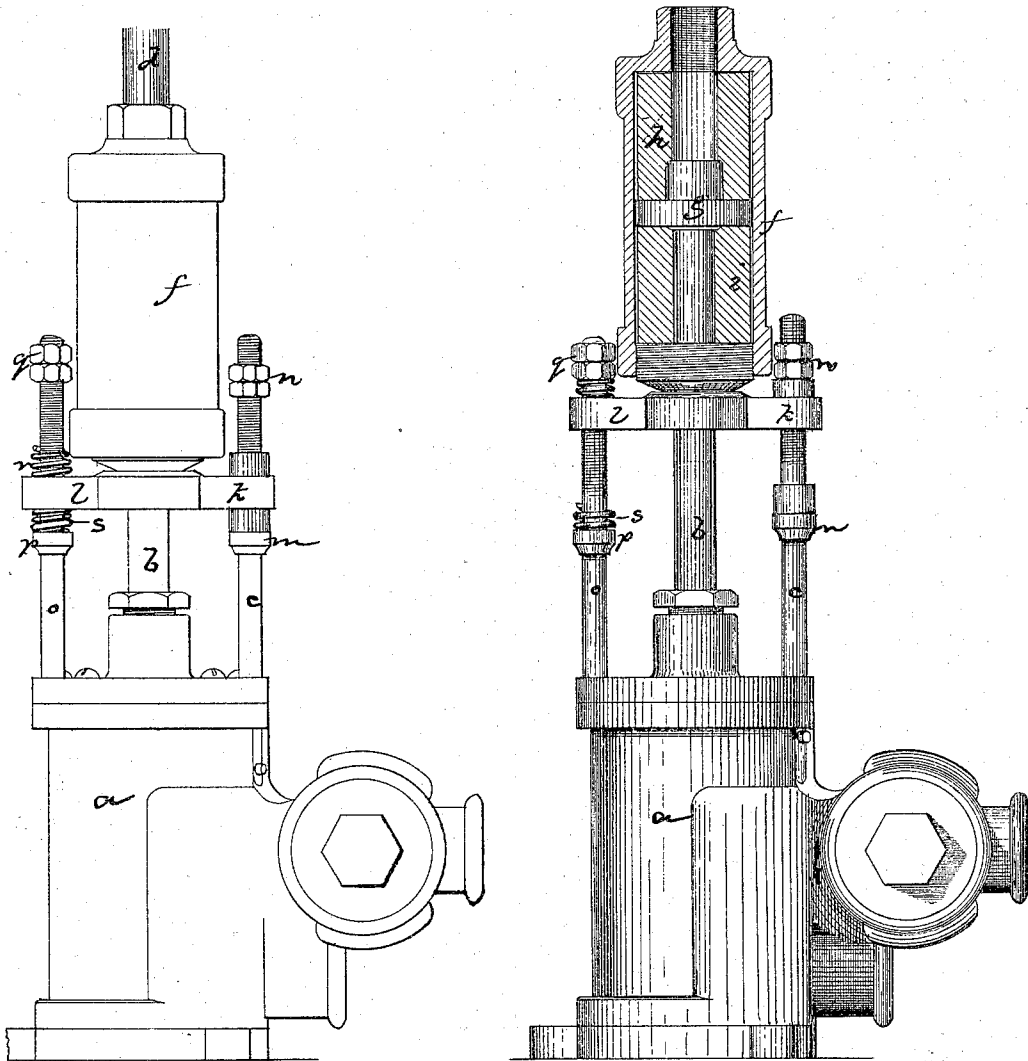


H. F. WHEELER.

Organ Lever - Couplings for Hydraulic Motors.

No. 138,546.

Patented May 6, 1873.



Witnesses.

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UNITED STATES PATENT OFFICE.

HENRY F. WHEELER, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN ORGAN-LEVER COUPLINGS FOR HYDRAULIC MOTORS.

Specification forming part of Letters Patent No. **138,546**, dated May 6, 1873; application filed July 3, 1872.

To all whom it may concern:

Be it known that I, HENRY F. WHEELER, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improved Organ-Lever Coupling for Hydraulic Motors; and I do hereby declare that the following, taken in connection with the drawing which accompanies and forms part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

This invention relates to the construction and arrangement of cushioning or spring devices to be applied to a hydraulic motor designed for operating the bellows of an organ, the object of the invention being to overcome the jar or concussion at the beginning and end of the stroke, and consequent upon the change of stroke.

The piston-rod of the motor continues up from the motor-cylinder and is attached, at its top, to the bellows-operating lever, and I make the rod in two parts connected together by a coupling-box, there being in the box a rubber cushion between the two parts of the piston-rod and another cushion made as a ring, through which one part of the rod passes, so that as the piston starts on its up-stroke to lift the bellows-lever the first force is exerted against and compresses one of the cushions, while, when the piston starts down to draw down the bellows-lever, the first or immediate strain is upon the other cushion, so that in each case the force is applied gradually to the bellows-lever without jar or shock. The piston-rod carries an arm which, in moving up or down, strikes a projection on the valve-rod to shift the valve, and I employ, in connection with the sliding valve-rod, a stationary rod, upon which are stops and springs, the springs being in the path of movement of the arm on the piston-rod, and each spring, with the adjacent stop, being so located that, after the piston-arm in its movement strikes the valve-rod stop and shifts the valve, the piston can have a continued movement, the piston-rod arm striking the spring on the stationary arm, permitting the piston to move on, cushioned by the spring, until the movement of the valve is completed, and the course of the water changed.

It is in the combination, with the hydraulic

motor, of these springs and stops that my invention consists.

The drawing represents a motor embodying my invention.

a denotes the motor-cylinder; *b*, the piston-rod; *c*, the valve-rod; *d*, the continuation of the piston-rod, or the rod extending up to and attached to the bellows-lever. *f* denotes the coupling-box that, with its devices, couples the pieces *b d*. The rod *b* extends through and slides in the box *f*, and has a head, *g*. Between the head *g* and the upper end of the box is a rubber spring, *h*, and under the head, around the rod *b*, is a rubber ring or collar, *i*, and, with the two springs *h i*, it will be seen that as the piston-rod starts in either direction the stress is immediately against one of the springs, and that motion is only gradually imparted to the bellows-lever, and without shock. Two arms or projections, *k l*, are fixed to and extend from opposite sides of the rod *b*, and through the arm *k* the valve-rod *c* runs. On this rod is a stop, *m*, and a nut, *n*, and between this stop and nut the arm plays, the arm at the end of its upward movement (and the upward movement of the piston) striking the nut *n*, (or a spring or washer interposed between the nut and arm,) and thereby raising the valve-rod and shifting the valve, and at the end of its down stroke striking the stop *m* and moving the valve-rod downward and reshifting the valve; but as the valve does not always perfectly shift or move, I arrange for a continued movement of the piston-rod that shall ease the stroke of the piston, as follows: On the opposite side of the cylinder *a* I extend from the head a fixed rod, *o*, and upon this rod I place a stop, *p*, and a stop or nut, *q*, interposing between the nut *q* and the arm *l* (the arm *l* sliding upon the rod *o*), a spring, *r*, and between the stop *p* and the arm a spring, *s*. The stops *p q* are at some distance apart, and are so located that as the piston rises the arm *l* strikes the nut *n* before the arm *l* strikes the spring *r*, (or cramps said spring between it and the nut *q*;) and if the valve does not so move as to immediately change the course of the water to start the piston back, the arm *l* then moves against the spring *r*, thereby preventing the piston from striking the head of the cylinder

or from stopping suddenly. So, when the piston descends, the arm *k* first strikes the stop *m*, (or a spring or washer between the stop and the arm,) and as the rod *c* is moved down, then strikes the springs, bearing against and cramping the spring until, by the change of the current of water, the piston is again started up.

The stroke of the piston is made adjustable by making the rod *c* above the stop *n* as a screw, and the upper stop *n* as a nut adjustable upon said screw, thereby shifting the valve at any length of stroke, the other rod *o* being similarly screw-threaded for adjustment of the nut *q*.

By these several provisions the utmost smoothness of motion and freedom from jar and concussion are obtained in working the

levers of organ-bellows with any length of stroke required for any particular organ.

I claim—

1. In combination with the motor-cylinder and its piston-rod, the coupling-box *f* and its cushions or springs *h i*, substantially as shown and described.

2. In combination with the cylinder *a*, piston-rod *b*, valve-rod *c*, and stops *m n*, the stationary rod *o* with its stops *p q* and springs *r s*, substantially as shown and described.

3. In combination with the rod *b*, arms *k l*, and rods *c o*, the adjustable stops *n q*, substantially as shown and described.

Witnesses: HENRY F. WHEELER.

FRANCIS GOULD,

M. W. FROTHINGHAM.