

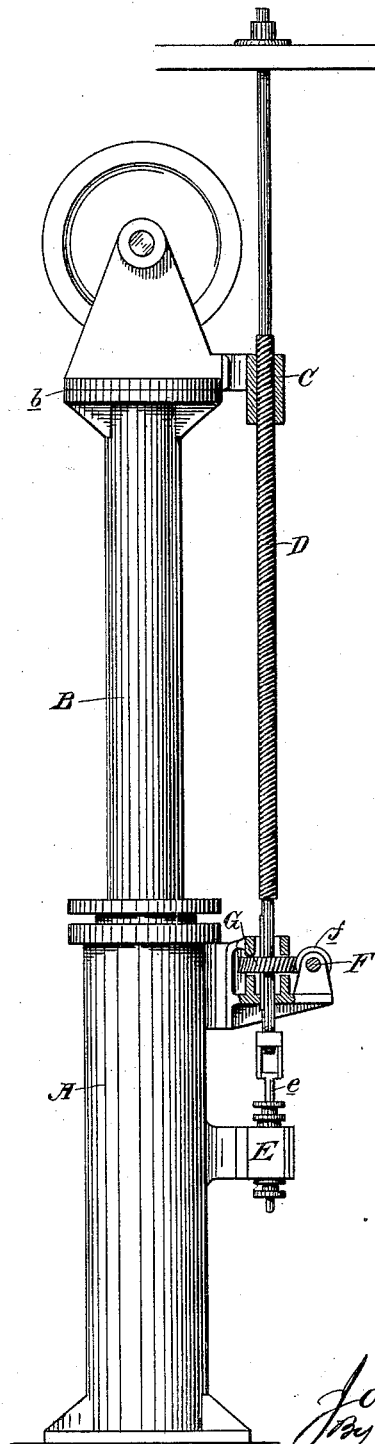
(No Model.)

J. PARKIN.

VALVE GEAR FOR FLUID RAMS AND PISTONS.

No. 419,874.

Patented Jan. 21, 1890.



Witnesses,
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UNITED STATES PATENT OFFICE.

JOHN PARKIN, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-HALF
TO HUGO P. FREAR, OF SAME PLACE.

VALVE-GEAR FOR FLUID RAMS AND PISTONS.

SPECIFICATION forming part of Letters Patent No. 419,874, dated January 21, 1890.

Application filed October 16, 1889. Serial No. 327,216. (No model.)

To all whom it may concern:

Be it known that I, JOHN PARKIN, a citizen of Great Britain, residing in the city and county of San Francisco, State of California, have invented an Improvement in Valve-Gears for Fluid Rams and Pistons; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to that class of machines to be operated by water or other fluids, and usually known as fluid rams or pistons; and my invention consists in the novel mechanism for operating the valve and controlling the motion of the ram or piston, hereinafter fully described, and specifically pointed out in the claims.

The object of my invention is to provide a simple and effective mechanism for safely controlling the motion of the ram or piston.

Referring to the accompanying drawing for a more complete explanation of my invention, the figure is a side elevation of a ram or piston, showing the application of my valve-gear.

A is the cylinder, in which the ram or piston B is mounted and adapted to reciprocate. On the head *b* of the ram or piston is securely and rigidly fixed a nut C. In this nut is seated a screw D, which is so mounted in its bearings as to have a slight longitudinal movement, sufficient to operate the valve with which it is connected. Connected with the cylinder is the valve-chest E, in which a suitable valve, not necessary herein to show, is mounted and controls the entrance and exhaust of the water to and from the cylinder. The lower end of the screw D is connected with the valve-rod *e*, either directly or in any suitable manner, whereby the valve is operated by the longitudinal movement of the screw. The valve-chest is stationary, while the nut C, being connected with the piston or ram, moves with it. Any suitable mechanism may be employed for the purpose of rotating the screw D, though I have here shown one form consisting of a power-shaft F, having a worm *f*, which meshes with the worm-gear G, which is feathered on the lower end of the screw and is mounted in a suitable housing or bracket secured to the side of the cylinder,

so that by the operation of the worm-gear the screw may be rotated and yet have its longitudinal movement through the gear.

The operation of the device is as follows: Assuming the ram or piston to be in an elevated or extended position and to be stationary, being held by the water beneath it, said water being cut off from the exhaust, now to retract the piston or ram the screw is rotated in such a direction as will move the valve to open the exhaust-port. Say, for the sake of description, that the screw is to be so rotated that, working through the fixed nut C on the head of the ram or piston, it will travel upwardly, thereby raising the valve to expose the exhaust. As soon as the screw is moved longitudinally far enough to open the exhaust the water under the ram passes out and the ram begins to withdraw into the cylinder, carrying the fixed nut C back, and, said nut engaging the screw, the latter is immediately drawn back again, thereby tending to close the exhaust; but it is obvious that if the screw continue to be rotated the exhaust will be kept open, while by this very rotation, which is necessary to keep the exhaust open, the nut C and the ram or piston to which it is attached will continue to move back or down. Therefore after the initial longitudinal movement of the screw necessary to operate the valve said screw, though continuously rotated, will remain stationary longitudinally, the nut C moving on it, and the movement of the nut and the ram is equal to the apparent movement of the screw, and the movement of the ram is thereby fully controlled. The reverse operation is similar to that described, the screw being turned in the opposite direction to close the exhaust and open the inlet. Generally speaking, as the screw is rotated the valve opens and the ram or piston moves until it overtakes the screw and pushes it longitudinally in a direction opposite to that due to its rotation, and thus closing the valve or valves; wherefore it is obvious that the ram will move in either direction, according to which side of the valve is open, and keep moving so long as the screw is rotated. The screw receives its initial longitudinal motion by rotating in the fixed nut

on the ram or piston, and its secondary or differential motion in the opposite direction by the direct travel of the ram or piston.

The valve may be worked by the screw directly or connected to it by one or more links, levers, &c.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The valve-gear for controlling the motion of fluid rams or pistons, consisting of the longitudinally-movable screw connected with and adapted to operate the valve of the ram or piston cylinder, and the nut fixed to the moving ram or piston and in which the screw is seated, substantially as herein described.

2. The valve-gear for controlling the motion of fluid rams or pistons, consisting of the longitudinally-movable screw connected with and adapted to operate the valve of the ram or piston cylinder, the nut fixed to the moving ram or piston and in which the screw is seated, and means connected with the screw for rotating it, substantially as herein described.

3. The cylinder, the ram or piston mounted therein, and a suitable valve in a stationary valve-chest for controlling the port of the cylinder, in combination with the nut fixed to the ram or piston and the longitudinally-movable rotary screw seated in the nut and connected with the valve of the cylinder, substantially as herein described.

4. The ram-cylinder, the ram or piston therein, and the valve in the stationary valve-chest controlling the port of the cylinder, in combination with the nut fixed to the ram or piston, the longitudinally-movable screw seated therein and connected with the valve, whereby said valve is operated, and the means for rotating the screw, consisting of the worm-gear feathered on the screw, the shaft, and the worm on the shaft engaging the worm-gear, substantially as herein described.

In witness whereof I have hereunto set my hand.

JOHN PARKIN.

Witnesses:

S. H. NOURSE,
J. H. BLOOD.