

(No Model.)

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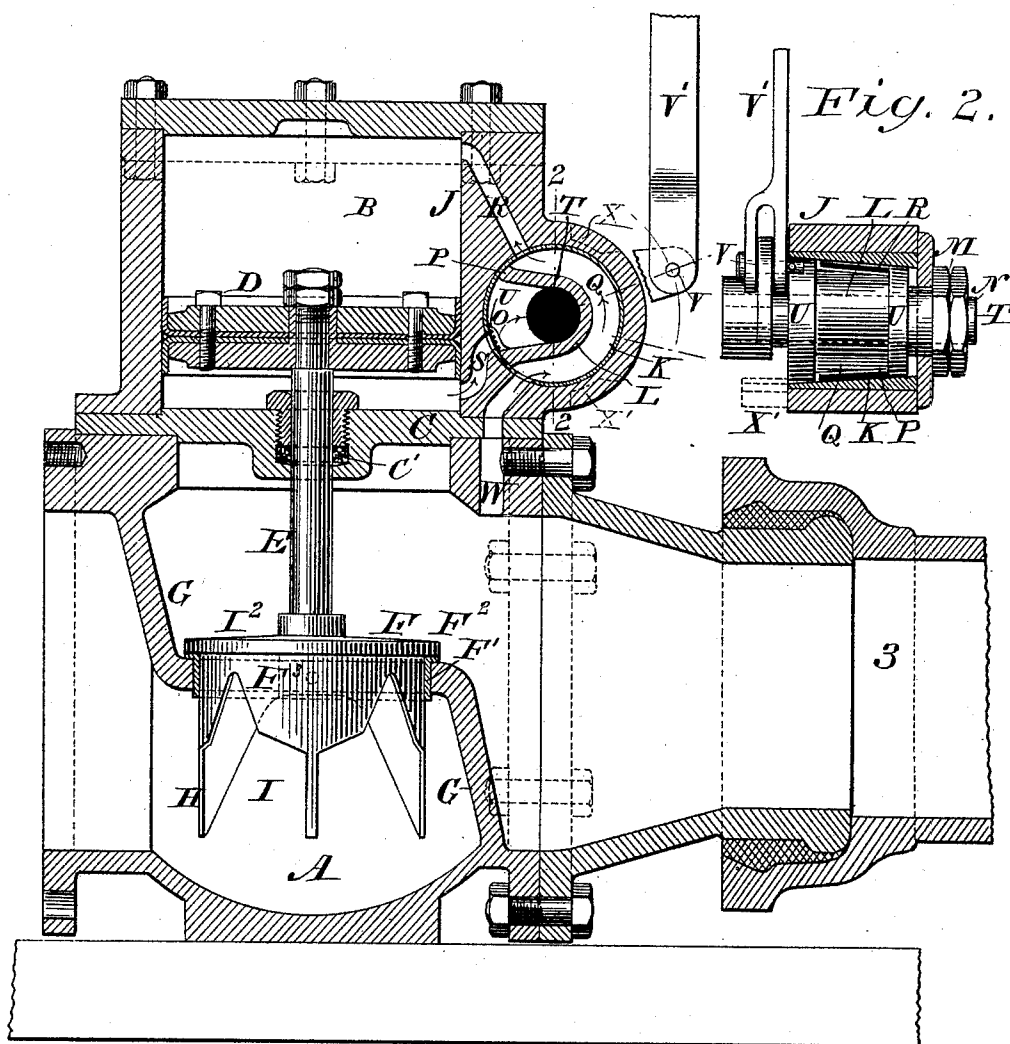
H. F. PROBERT.

HYDRAULIC VALVE MECHANISM.

No. 412,789.

Patented Oct. 15, 1889.

Fig. 1.



WITNESSES

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(No Model.)

2 Sheets—Sheet 2.

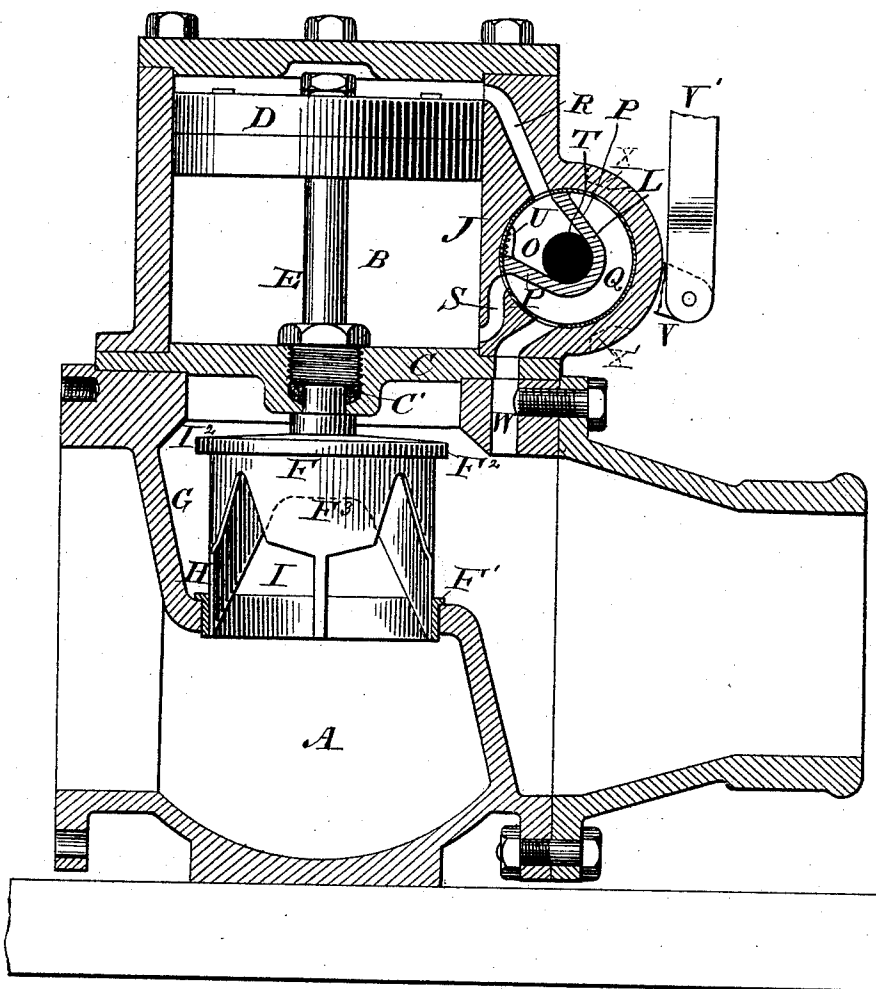
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HYDRAULIC VALVE MECHANISM.

No. 412,789.

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Fig. 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

HUBERT F. PROBERT, OF THREE RIVERS, MICHIGAN, ASSIGNOR OF ONE-HALF TO THE SHEFFIELD VELOCIPEDE CAR COMPANY, OF SAME PLACE.

HYDRAULIC-VALVE MECHANISM.

SPECIFICATION forming part of Letters Patent No. 412,789, dated October 15, 1889.

Application filed November 12, 1888. Serial No. 290,581. (No model.)

To all whom it may concern:

Be it known that I, HUBERT F. PROBERT, of Three Rivers, county of St. Joseph, and State of Michigan, have invented certain new and useful Improvements in Hydraulic-Valve Mechanism, of which the following is a specification, reference being had to the accompanying drawings.

The object of my invention is to provide a device for automatically opening and closing the passage of a confined current of water, and which will operate to check and stop with facility a current of any force.

My invention consists in such improvements as I hereinafter describe in detail, and succinctly specify in my claims.

In the accompanying drawings, Figure 1 is a vertical central section of my improved valve mechanism partly in elevation. Fig. 2 is a section, partly in elevation, on the line 2 2 of Fig. 1; and Fig. 3 is a like view to Fig. 1, showing the operating parts in different positions.

Referring to the letters upon the drawings, A is the main-valve casting, fixed to a pipe 3, assumed to communicate with a source of water-supply. (Not illustrated.)

B is a pressure-cylinder.

C is a separating-plate.

D is a piston working within the pressure-cylinder.

E is a piston-rod fixed to the piston, passing through the plate C, and attached to the main valve F. The plate C is provided with suitable packing C' around the piston-rod E.

G is an angular partition made integral with the valve-casting, and arranged so that its middle portion shall be horizontal and midway between the upper and lower parts of the valve-casting. This horizontal portion is provided with a valve-seat F', to receive the valve F, which, when pressed down upon the seat, forms a water-tight joint. This valve is composed of a disk F² and a cylindrical part F³, having tapering projections H, with spaces I between them. The object of these is to provide means by which the valve may be guided within the valve-seat, and by depressing it gradually shut off the flow of water through the pipe.

The side J, which I will call the "auxiliary-

valve casting," of the pressure-cylinder B is cast with a taper opening K, within which is fitted an auxiliary valve L, that is held in place by the cap M and bolt N. This auxiliary valve is constructed with an interior U-shaped compartment O, the ends P of the walls of which are fitted tightly against the walls of the taper opening K to prevent the passage of water around them.

Q is a water-passage formed on the outside of the walls P and around the U-shaped compartment O.

W is a port connecting the interior of the main-valve casting and the interior of the taper opening K.

R is a port communicating with the upper part of the interior of the pressure-cylinder B and the taper opening K.

S is a port communicating with the interior of the lower part of the pressure-cylinder B and the taper opening K.

T is an opening or nozzle leading out of the U-shaped compartment O.

U is a bridge within the U-shaped compartment O, made integral with one end of its wall P, and provided with cuts or notches to allow the passage of water slowly around it, the rapidity of flow being dependent upon the size of the cuts or notches.

V is a lever secured to the auxiliary valve L for oscillating it, and having an operating hand-piece V', partly broken off.

X X' are lugs to limit the arc of motion of the lever V.

Fig. 3 illustrates the valve mechanism with the main valve raised, the water passing freely through the pipe 3. When (the mechanism being in this position) the lever V is raised, the walls of the U-shaped compartment O turn within the auxiliary-valve casting J until the port W is brought into communication with the water-passage Q and the port R, admitting the flow of water from the pipe 3. The pressure from the pipe 3 is thus exerted upon the top of the piston D and tends to force it down. The descent of the piston is resisted by water, which is contained in the lower part of the pressure-cylinder B; but this water is gradually forced out through the port S and through the bridge U into the compartment O, and thence discharged through

the nozzle T, thus permitting the piston to descend. The main valve F is at the same time forced down upon the valve-seat, and there held by the pressure of the water in the upper part of the pressure-cylinder upon the piston.

It will be observed, as indicated above, that the projections H of the valve operate to gradually resist the current of water, so that the flow is shut off without shock, which, where a large volume of water is to be checked, might injure the valve mechanism.

If, now, it is desired to turn on the flow of water, the lever V may be depressed, as shown in Fig. 3, when the port R will be placed in communication with the compartment O and the water-passage Q will connect the port W with the port S. The pressure of the water from the supply-pipe 3 is thus applied to the bottom of the piston D and forces it rapidly upward, the water in the upper portion of the pressure-cylinder B being freely discharged through the compartment O and the nozzle T.

It is desirable that the opening of the valve may be effected speedily, but that the closing may be effected more slowly, because there is not the same necessity to gradually throw on the supply of water as there is to shut it off, and because it is desirable to deliver the water for use without delay. There is, therefore, necessity for one bridge within the compartment O and no more.

It will appear from the description given above that after working the lever V by hand the operation of the main valve is entirely automatic.

Thus my invention provides simple and reliable means for utilizing the pressure in water-pipes to operate a main valve located in them by combining the valve with a piston and pressure-cylinder and any suitable auxiliary-valve mechanism for directing the pressure of the water above or below the piston.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination, with the water-main, of a hydraulic-valve mechanism consisting of a main valve for opening and closing the water-main, having an annular seat and tapering projections separated by water-spaces, a piston connected with the main valve, a single pressure-cylinder in which the piston works, an auxiliary-valve mechanism, a port connecting the auxiliary valve with the water-main, and two ports connecting the auxiliary valve with the pressure-cylinder, the one admitting water to the cylinder for opening the main valve and the other for closing it, substantially as set forth.

2. The combination, with the main valve and pressure-cylinder and piston, of the auxiliary valve L, the ports R, S, and W, a U-shaped compartment O, a water-passage Q, the bridge U, for controlling the flow through the port S, and opening T, constructed and arranged substantially as set forth.

In testimony of all which I have hereunto subscribed my name.

HUBERT F. PROBERT.

Witnesses:

EDWIN H. HENDERSON,
L. B. PLACE.