

W. FOSTER.  
Hydraulic-Pump.

No. 213,817.

Patented April 1, 1879.

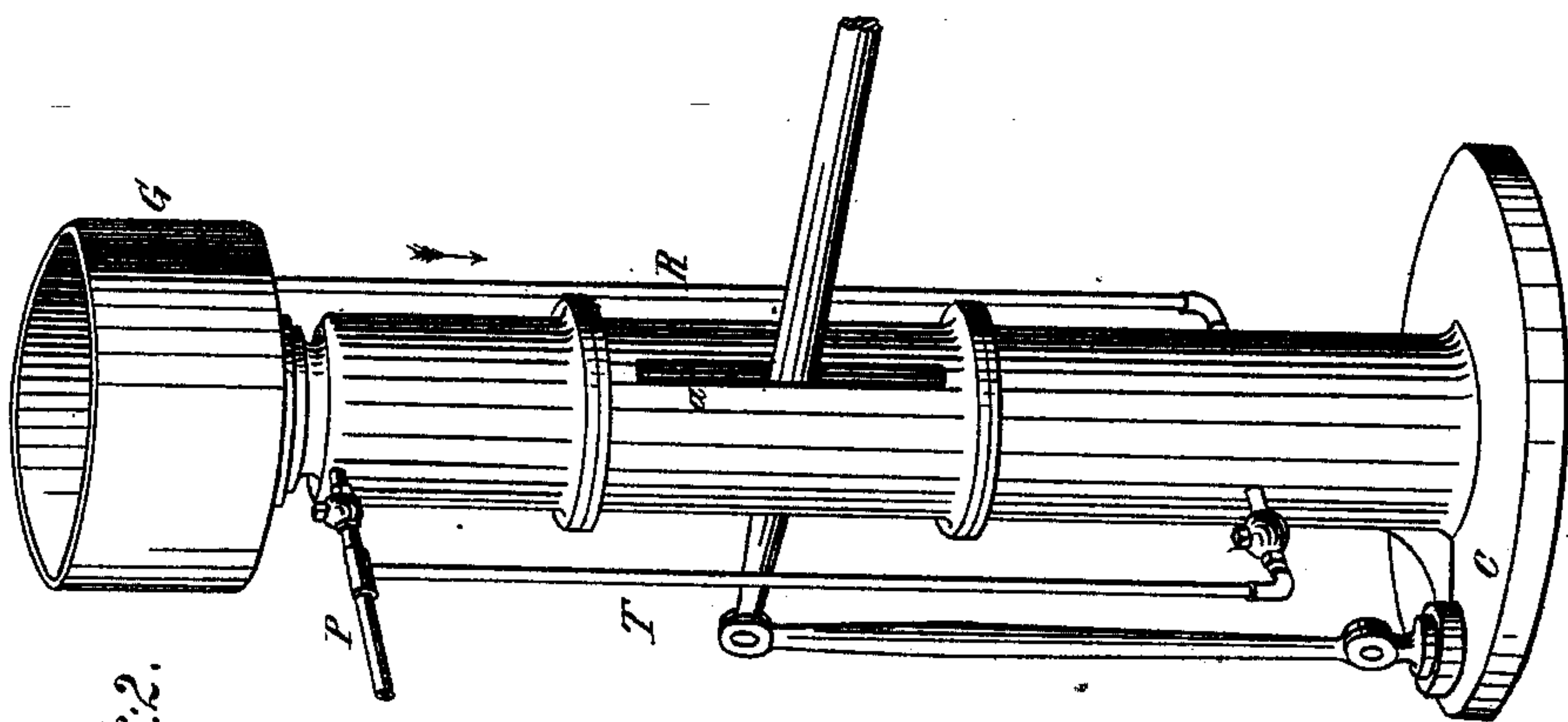


Fig. 2.

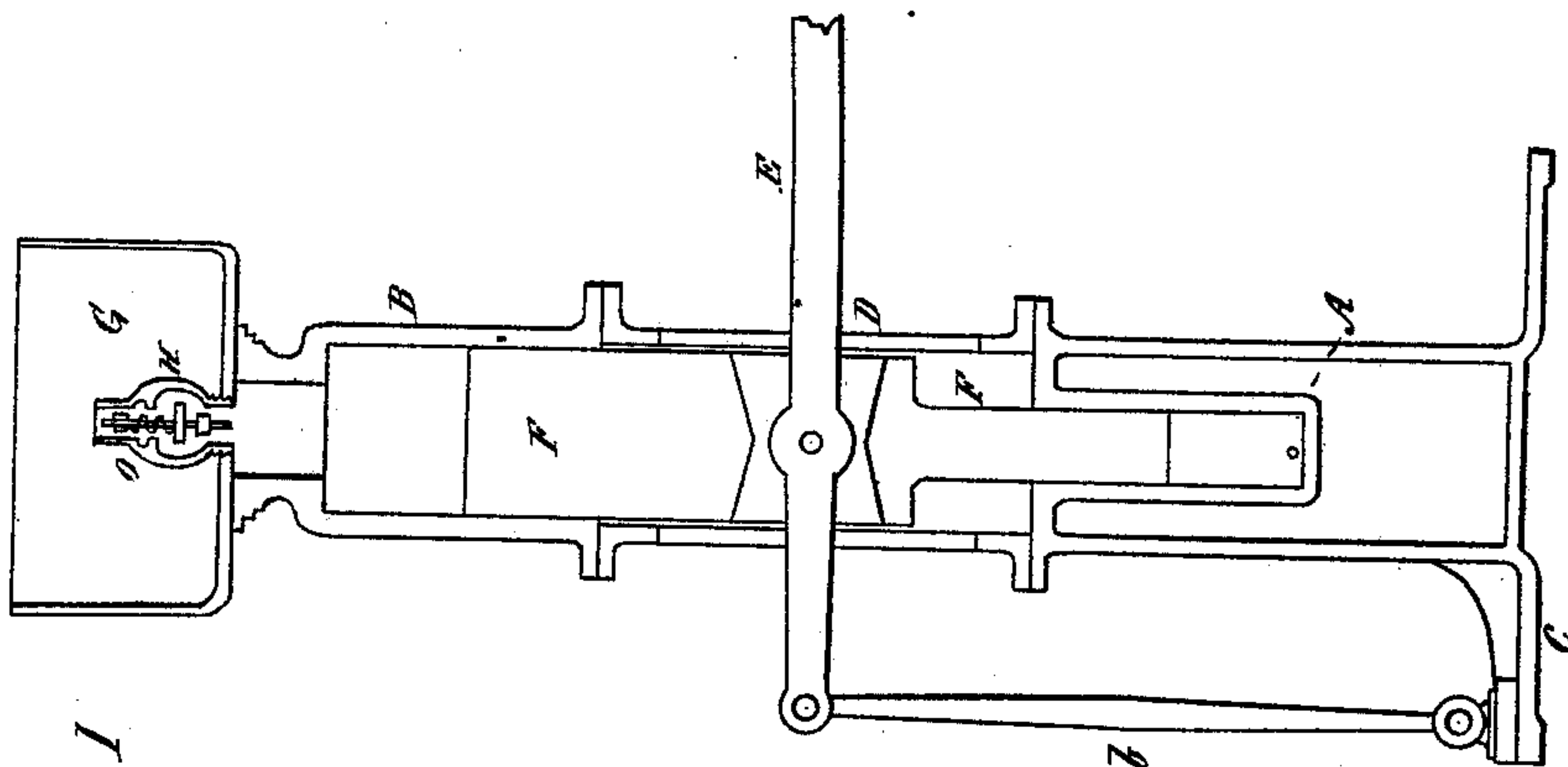


Fig. 1.

—Witnesses—  
Charles B. Loe  
Louis W. Frost

—Inventor—  
William Foster.

# UNITED STATES PATENT OFFICE.

WILLIAM FOSTER, OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN HYDRAULIC PUMPS.

Specification forming part of Letters Patent No. **213,817**, dated April 1, 1879; application filed February 19, 1879.

*To all whom it may concern:*

Be it known that I, WILLIAM FOSTER, of the city of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Hydraulic-Pressure Pumps; and that the following, taken in connection with the accompanying drawings, is a full, clear, and exact description of the same.

My invention relates to a double-plunger reciprocating pump, which is intended more particularly for machines where hydraulic pressure is required to be applied by hand-power, as in the pressing of straw, felt, stamped hats, and similar articles.

In working a hat-press or other hydraulic press of that character to a pressure of eight hundred or a thousand pounds to the square inch, a large amount of water has to be withdrawn from the press before it can be opened and the article pressed removed, and to again fill the press with water and put on the desired pressure with a small plunger alone consumes too much time. My invention is for the purpose of doing away with this disadvantage.

In the drawings, Figure 1 represents a vertical central section of my invention; Fig. 2, a full view of the same.

My improvement is made as follows: I form my improved hydraulic pumps with two cylinders, A and B. The cylinder A is of smaller diameter than the cylinder B, and is secured to the base C of the pump, and the larger cylinder, B, is inverted, and secured to the cylinder A by means of the connection or distance piece D, which thus keeps the two cylinders A and B in line. The connecting-piece D is provided with the guides *a*, in which work up and down the lever or handle E. This lever E is pivoted to a post, *b*, which is secured to the base C of the pump.

Within the cylinders A and B is the double plunger F. This plunger F, of larger diameter in the cylinder B and of smaller diameter in the cylinder A, is connected together, and is provided with suitable packing, so that it can be worked up and down within the cylinders A and B by means of the lever or handle E.

G is a reservoir of water, placed above the cylinder B. Connecting the reservoir G with the cylinder B is the valve H, provided with the spiral spring O. P is a pipe, which connects the cylinder B with the press. R is a pipe, which connects the reservoir G with the cylinder A. T is a discharge-pipe, connecting the cylinder A with the pipe P.

The operation of my improvement is as follows: When the double plunger F is at the lower part of the cylinder B, a quick upward stroke of the plunger F is given by means of the lever or handle E. This stroke compresses the spring O of the valve H, and thus closes it. The water which was in the cylinder B is thus forced through the pipe P into the press. The upward stroke of the plunger F allows water to pass through the pipe R from the reservoir G into the cylinder A, which water the return downward stroke of the plunger F forces through the pipe T into the press. Should this downward stroke fail to give the pressure desired, two or more strokes can be given with the smaller plunger F by carrying the plunger F gently up by means of the lever E. In this case water above the plunger F in the cylinder B, instead of being forced into the pipe P by the closing of the valve H, is allowed to flow back into the reservoir G, the valve H being held open by means of the spiral spring O; but when a quick stroke of the lever E is given the water compresses the spring O, and thus closes the valve H, and forces the water into the press to fill it, and then leaving the pressure to be put on by the smaller plunger.

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

1. The cylinders A and B, double plunger F, and valve H, provided with the spring O.
2. The cylinders A and B, double plunger F, and valve H, provided with the spring O, in combination with the reservoir G.
3. The cylinders A and B, double plunger F, and valve H, provided with the spring O, in combination with the reservoir G and pipe P.
4. The combination of the cylinders A and B, double plunger F, valve H, provided with the spring O, lever E, and reservoir G.



5. The cylinders A and B, double plunger F, valve H, provided with the spring O, lever E, reservoir G, and pipe P.

6. The combination of the cylinders A and B, double plunger F, valve H, provided with spring O, lever E, reservoir G, and pipes P and R.

7. The combination of the cylinders A and B, double plunger F, valve H, provided with

the spring O, lever E, reservoir G, and pipes P, R, and T.

In testimony whereof I have hereunto set my hand this 17th day of February, 1879.

WILLIAM FOSTER.

In presence of—

CHARLES G. COE,  
LOUIS W. FROST.