

No. 778,168.

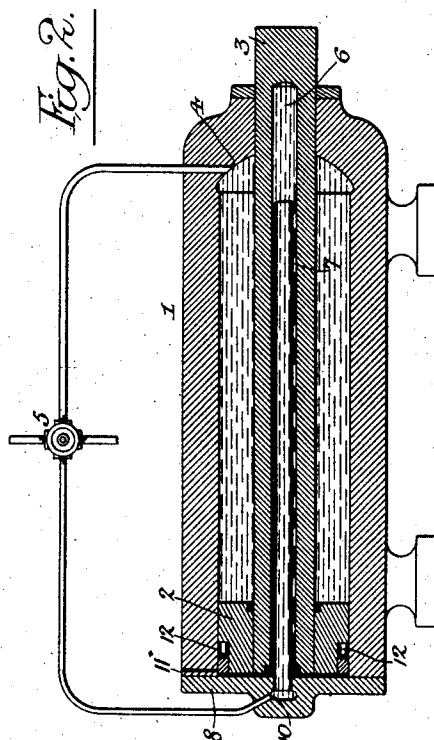
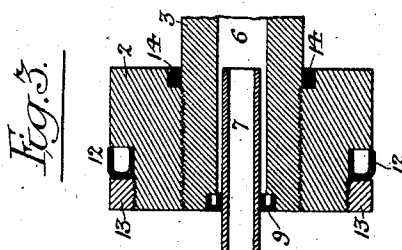
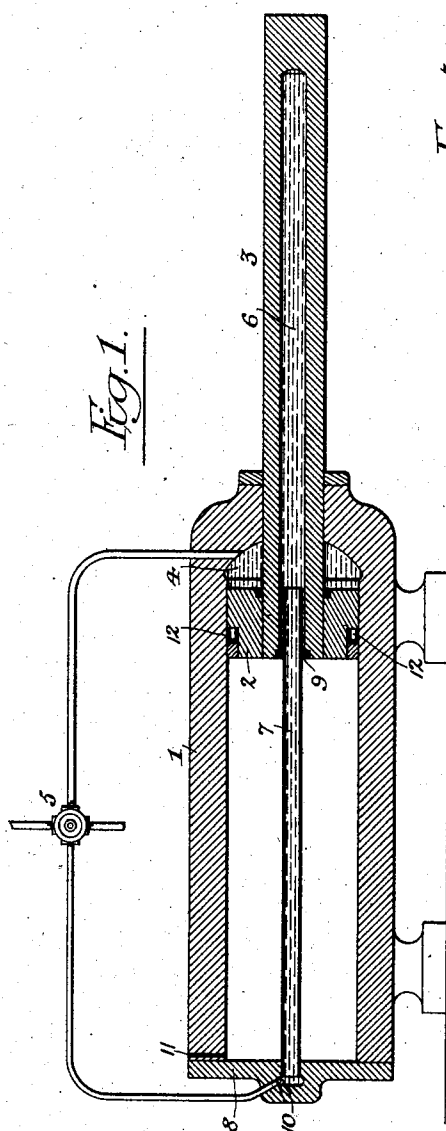
PATENTED DEC. 20, 1904.

J. W. BRAMWELL.

HYDRAULIC PRESSURE APPARATUS.

APPLICATION FILED FEB. 3, 1903.

NO MODEL.



Witnesses:-

Herman E. Meiers.

Frank L. Graham

Inventor:-

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UNITED STATES PATENT OFFICE.

JOSEPH W. BRAMWELL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR
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HYDRAULIC-PRESSURE APPARATUS.

SPECIFICATION forming part of Letters Patent No. 778,168, dated December 20, 1904.

Application filed February 3, 1903. Serial No. 141,729.

To all whom it may concern:

Be it known that I, JOSEPH W. BRAMWELL, a subject of the King of Great Britain and Ireland, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Hydraulic-Pressure Apparatus, of which the following is a specification.

My invention relates to hydraulic-pressure apparatus; and it consists of means for giving the pressure-controlled plunger or piston a quick return stroke after it has completed its working stroke.

My invention may be applied to all forms of hydraulic-pressure apparatus, and in the accompanying drawings I have simply shown an ordinary cylinder containing a piston and plunger made in accordance with my invention, in which—

Figure 1 represents a sectional elevation showing the piston-rod or plunger in the extended position. Fig. 2 is a similar view showing the piston-rod or plunger in the retracted position, and Fig. 3 is an enlarged sectional view of the piston.

In hydraulic-pressure apparatus as ordinarily constructed and arranged where the piston is designed to effect a pulling stroke it requires a longer time to return the piston in the cylinder after it has made its working stroke than to make such stroke, inasmuch as the space in the cylinder behind the piston is of greater area and must be filled with a greater quantity of liquid than is employed in giving such piston the working stroke. To overcome this difficulty heretofore present and without extending the size or shape of the cylinder, I utilize the piston-rod as the means for giving the piston the return stroke, such piston-rod being constructed to form an auxiliary piston and cylinder.

In the accompanying drawings, 1 represents an ordinary cylinder built to withstand heavy fluid-pressure, having a piston 2 and piston-rod 3, to which rod connection may be made from any form of apparatus, in the present instance forming part of a hydraulic testing-machine designed to effect a pulling strain. The pressure to move the piston during the

operating stroke enters the main cylinder at 4 from any suitable pressure apparatus, being controlled by a valve 5, and during the return stroke of the piston such pressure is exhausted through this opening. The piston-rod is recessed at 6 substantially its entire length, and adapted to this recessed portion is a pipe or tube 7, secured in the rear head 8 of the cylinder. This pipe is suitably packed at the opening 9, where it enters the hollow space in the piston-rod. The pressure-inlet for this pipe is shown at 10, which also provides for the exhaust of the fluid under pressure when the piston is moving on the working stroke, such inlet and exhaust being also controlled by the valve 5. At the end of the working stroke it is desired, of course, to return the piston and its rod as quickly as possible in order to make another working stroke. For this purpose fluid under pressure is admitted at the point 10 and passing into the pipe 7 acts upon the reduced area in the piston-rod at the end of the recess 6 within the same. This area within the rod being so much smaller and requiring so much less volume of fluid than the space in the cylinder behind the piston, the piston is moved forward rapidly and the piston-rod returned for a new working stroke. Provision is made for exhausting any leakage that may exist in the cylinder during the return stroke of the piston-rod, and for this purpose an outlet may be made at the point 11. The piston is packed by means of ordinary U-shaped leathers at 12, secured in place by a suitable ring 13, in order that a fluid-tight engagement with the wall of the cylinder may be maintained. The piston-rod is also packed at 14, where it is inserted in the piston.

The structure which I have devised is entirely self-contained, requiring no addition or extension to the cylinder, and hence not taking up any more room than the usual form of apparatus. While adapted for use with general hydraulic-pressure apparatus, it has been designed particularly for use with testing machinery arranged to determine the tensile strength of material.

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

1. In hydraulic - pressure apparatus, the combination of the cylinder, a piston therein,
5 means for admitting motive fluid under pressure to the cylinder to impart the working stroke to the piston and for discharging said motive fluid from the cylinder, a hollow piston-rod forming an auxiliary cylinder closed
10 at the end, said rod being connected to the piston in line with the main cylinder and movable through the end of the latter, a tubular stem connected to the rear end of the cylinder and registering with the tubular chamber
15 of the piston-rod, and means connected to said tubular stem for the inlet and discharge of motive fluid to act upon the end wall of the hollow piston-rod for the purpose of imparting the return stroke to the piston.

20 2. In hydraulic - pressure apparatus, the combination of the cylinder, a piston therein,

a pipe for the inlet of motive fluid to impart the working stroke to the piston and for discharging said motive fluid from the cylinder, a hollow piston-rod forming an auxiliary cylinder closed at the end, said rod being connected to the piston in line with the main cylinder and movable through the end of the latter, a tubular stem connected to the rear end of the cylinder and registering with the tubular chamber of the piston-rod, and a pipe connected to said tubular stem for the inlet and discharge of motive fluid to act upon the end wall of the hollow piston-rod for the purpose of imparting the return stroke to the piston.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEPH W. BRAMWELL.

Witnesses:

MURRAY C. BOYER,
JOS. H. KLEIN.