

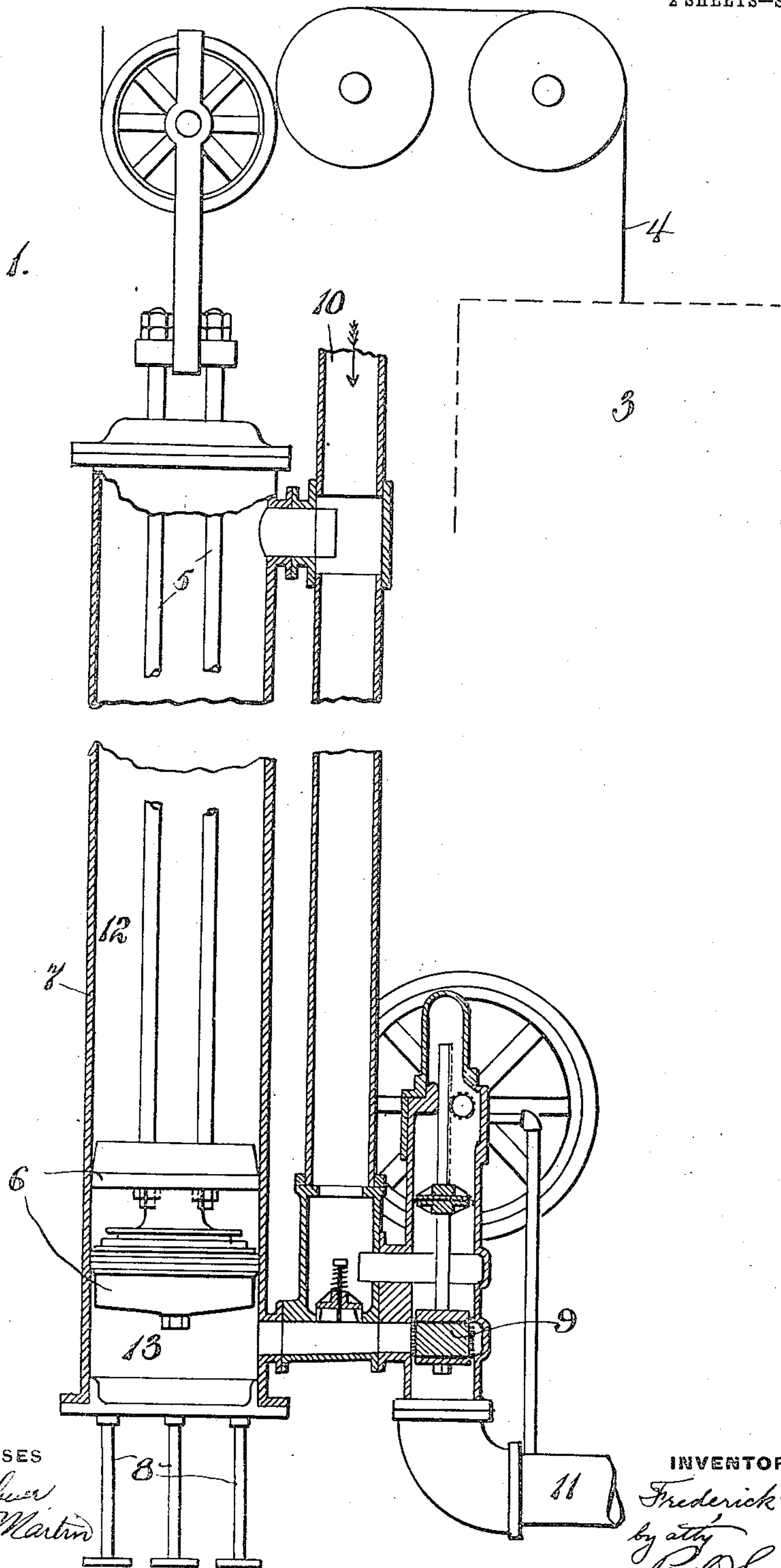
F. HYMANS.  
HYDRAULIC PACKING.  
APPLICATION FILED JAN. 13, 1909.

938,870.

Patented Nov. 2, 1909.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES  
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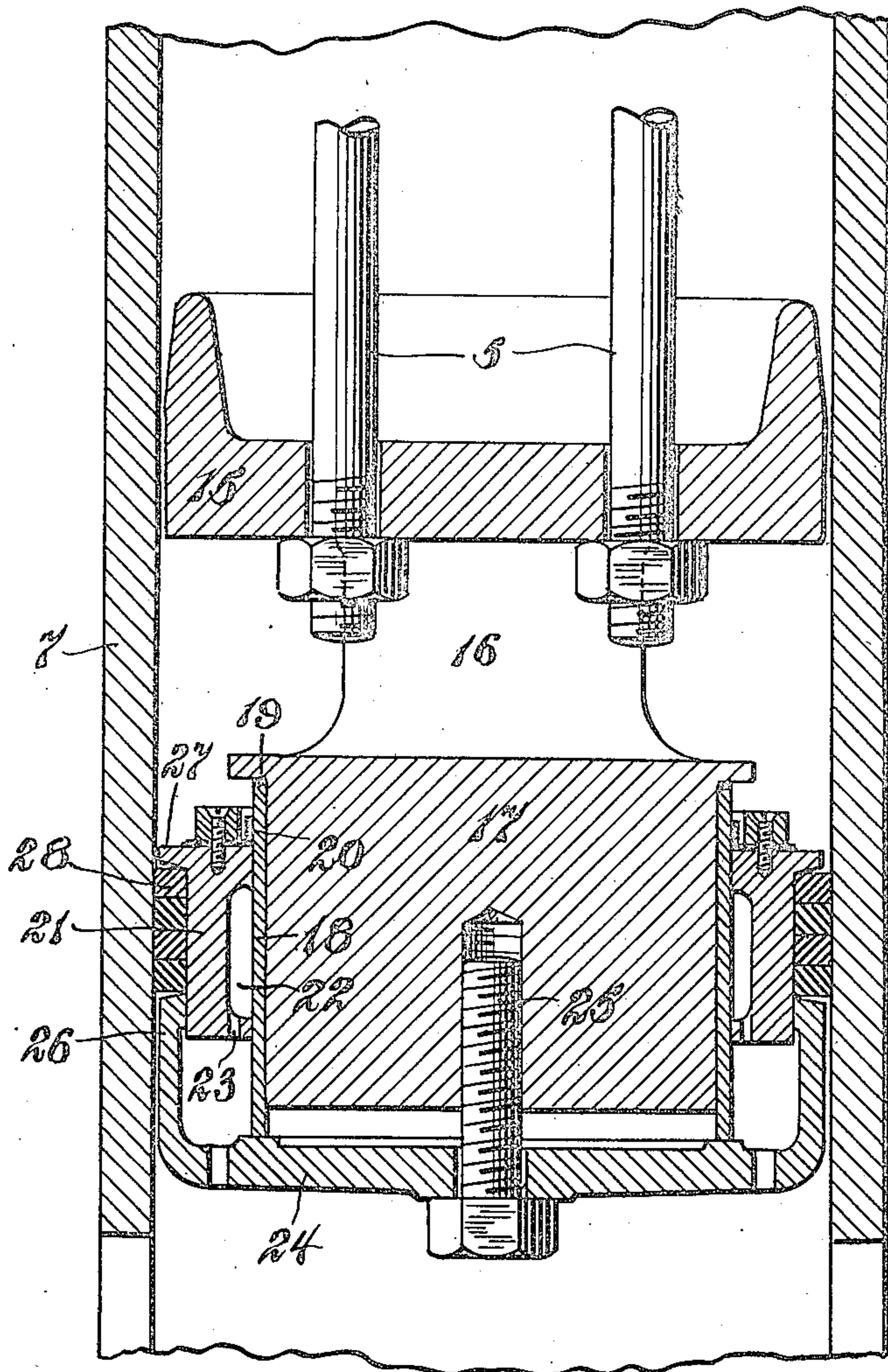
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2 SHEETS—SHEET 2.

Fig. 2.



WITNESSES

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# UNITED STATES PATENT OFFICE.

FREDERICK HYMANS, OF PITTSBURG, PENNSYLVANIA.

## HYDRAULIC PACKING.

938,870.

Specification of Letters Patent.

Patented Nov. 2, 1909.

Application filed January 13, 1909. Serial No. 472,061.

*To all whom it may concern:*

Be it known that I, FREDERICK HYMANS, a subject of the Queen of the Netherlands, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Hydraulic Packing, of which the following is a specification.

This invention has particular reference to the provision of an improved form of packing mechanism for pistons employed in hydraulic devices, such for example as elevators, and has for its primary objects; the provision of a packing of this character which will admit of ready renewal when occasion requires, and will not require frequent renewal; which will secure a better joint than forms of packings heretofore used in this class of device, and which in various other ways will secure superior results, especially in connection with the provision of a stable degree of friction between the piston and cylinder within which it works.

The above, as well as such other objects as may hereinafter appear, I obtain by means of the construction which I have illustrated in preferred form in the accompanying drawings, wherein—

Figure 1 is a side elevation partly in section, showing somewhat diagrammatically an elevator device with vertical cylinder having my improvements applied thereto, and Figure 2 is a detail view on a larger scale indicating the arrangement of the packing mechanism made in accordance with my said invention.

Referring now more particularly to Figure 1 it will be seen that I have therein indicated an elevator car 3 operated by a cable 4, and suitable gears which may be of any desired arrangement, the same being connected to the customary rods 5 that are secured at their lower ends to a piston 6 operating within the cylinder 7.

As usually constructed, the cylinder 7 is supported upon suitable legs or standards 8, and is provided with some suitable form of controlling valve 9, the hydraulic pressure coming downward and entering the pipe at 10, as indicated by the arrow, this connection being in communication with the so-called pressure tank ordinarily employed in systems of this kind. The outlet or escape for the water is indicated at 11.

From the above description it will be evident that the upper side of the cylinder chamber indicated at 12 is the pressure side, and the lower side 13 what I will hereinafter call the outlet side, and that under normal conditions of operation the weight of the car will exert a pull upon the rods 5 and piston 6 in opposition to the pressure in the chamber 12, and said pull will be counterbalanced to greater or less extent by the pressure in chamber 13, depending upon the conditions of operation. It is one of the objects of my invention to arrange a packing in the piston 6 which will properly act, and the resistance of which will be proportioned in a degree to the difference in pressures between the chambers 12 and 13, so that if the pressure on the pressure side is correspondingly greater than that on the outlet side 13, the pressure on the packing will be increased, and contrariwise.

In order now to better understand the arrangement of packing which I provide, reference may be had particularly to Figure 2 wherein I have indicated in detail the piston construction and packing device which I employ. In such Figure 2 it will be seen that within the cylinder 7 is arranged the guide portion 15 of the piston to which the rods 5 are attached, and connected with said guide portion 15 by means of bridges 16, there is a body portion 17 provided with surrounding non-corrosive sleeve 18 preferably of brass, seated at its upper edge upon a small packing ring 19 usually made of fiber, the said sleeve 18 forming upon its outer face a bearing for a cup leather or other packing device 20 that is mounted upon what I shall term a movable or variable pressure gland 21, the said gland being chambered out as indicated at 22 in order to permit pressure from below to counterbalance the pressure upon the cup leather 20 through the ports 23.

At the bottom of the body portion 17 of the piston head I arrange the follower or cup shaped plate 24 secured by the threaded bolt 25 as indicated, and serving to hold the sleeve 18 firmly in place, besides having an upward projecting flange 26 which fits along the outer peripheral surface of the gland 21, and serves as the lower end of the packing chamber of which latter the flange 27 forms the upper boundary, the packing itself, 28,



being inserted in sections as shown, and being formed of any preferred or suitable material. It is customary in mechanism of this character to use a packing material such as hemp or other fibrous composition which when exposed to the action of the water will swell and become tighter, and it will be observed that if the packing material be filled in snugly within a chamber which is absolutely fixed in its limitations, the swelling may be excessive, so as to produce either excessive frictional resistance, or even in some cases, as experience teaches, resulting in a bursting of the cylinder itself.

The operation of my invention is as follows:

The packing and other parts having been placed in position as shown, and the water admitted on the pressure side, that is, above the piston, it is evident that the downward pressure exerted upon the cup leather will make the same tight against the bushing or sleeve 18 and move the gland 21 downward to create pressure upon the packing material 28 against the upward projection 26 of the follower or plate 24, the downward pressure being counterbalanced to some extent by the pressure on the under side of the piston head which passes upward through the apertures 23 to the chamber 22. If the packing 28 swells sufficiently it will react against the gland 21 and move it upward, the cup leather sliding upon the outer face of the sleeve 18 and thus will automatically compensate for such excessive swelling of the packing, and in turn will re-compress or continuously press the packing downward with a certain predetermined or reasonable degree of force just sufficient to set the packing out tightly against the inner face of the cylinder and at the same time not cause excessive frictional resistance.

If it be necessary to renew the packing it is obvious that this can readily be accomplished after the lower cylinder is taken off, by unscrewing the bolt 25 and taking down the follower 24 which will expose the packing 28 so that it can be taken out and new packing introduced, and new packing can be readily introduced by unskilled workmen, without the necessity of such accurate fitting, because the construction of the gland 21 being movable or adjustable under pressure in the direction of the axial line of the piston, will make the device self compensating or adjusting and do away with any necessity for such accurate fitting. As the packing wears the gland 21 will also automatically follow downward and hold the packing at all times spread out in proper position. The pressure of the gland upon the packing being dependent upon the preponderance of pressure upon the upper side of the piston, it is clear that the mechanism

described provides a means for automatically varying the fit of the packing or the pressure thereof upon the cylinder walls, in accordance with the said degree of preponderance of pressure, so that if a greater variation or difference exists the packing will be correspondingly or more tightly held.

It will be further evident from the above description of my invention that by this arrangement the resilience of the packing material is preserved because it is not subjected to excessive pressure initially, and it is also evident that the force to which the packing is to be subjected may be predetermined by the designer, by simple variation of the ring surface of the gland, the whole being so designed that just the requisite degree of force is imparted to the gland by the hydraulic pressure acting thereupon.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent, is the following:

1. An improvement in hydraulic packing, comprising in combination a cylinder, a piston operating therein, a packing chamber, packing in said chamber, and means constructed to exert pressure upon said packing, proportioned to the difference of pressure on opposite sides of said piston, substantially as described.

2. In combination, a cylinder, a piston therein, a packing bearing against the cylinder wall, and a gland intermediate the packing and the piston and slidable longitudinally thereof, the said gland being exposed to pressure from both sides of the piston.

3. In combination, a cylinder, a piston therein, a packing bearing against the cylinder wall, a gland slidable axially of the piston and bearing against the end of the packing, the said gland being exposed to pressure from both sides of the piston.

4. In combination, a cylinder, a piston therein, a packing bearing against the cylinder wall, a gland slidable axially of the piston and bearing against the end of the packing, and packing means between the gland and the piston, the said gland being exposed to pressure from both sides of the piston.

5. In combination, a cylinder, a piston therein, a packing bearing against the cylinder wall, a gland slidable axially of the piston and bearing against the end of the packing, and packing means between the gland and the piston, the said gland being exposed to pressure from the cylinder whereby it is forced down against the end of the packing and such packing spread laterally.

6. In combination, a cylinder, a piston provided with a flange 26, packing 28 at



the end of the flange, and a gland 21 provided with a flange 27 for compressing the packing, a passage being provided whereby the inner end of the gland is exposed to  
5 pressure from the cylinder.

7. In combination, a cylinder, a piston provided with a flange 26, packing 28, at the end of the flange, a gland 21 provided with a flange 27 for compressing the pack-  
10 ing, and packing means 20 between the pis-

ton and gland, the said gland being exposed to pressure from both sides of the cylinder.

In testimony whereof I have hereunto signed my name in the presence of the two subscribed witnesses.

FREDERICK HYMANS.

Witnesses:

PAUL SYNNESTVEDT,

HARVEY L. LECHNER.