No. 866,443. PATENTED SEPT. 17, 1907.

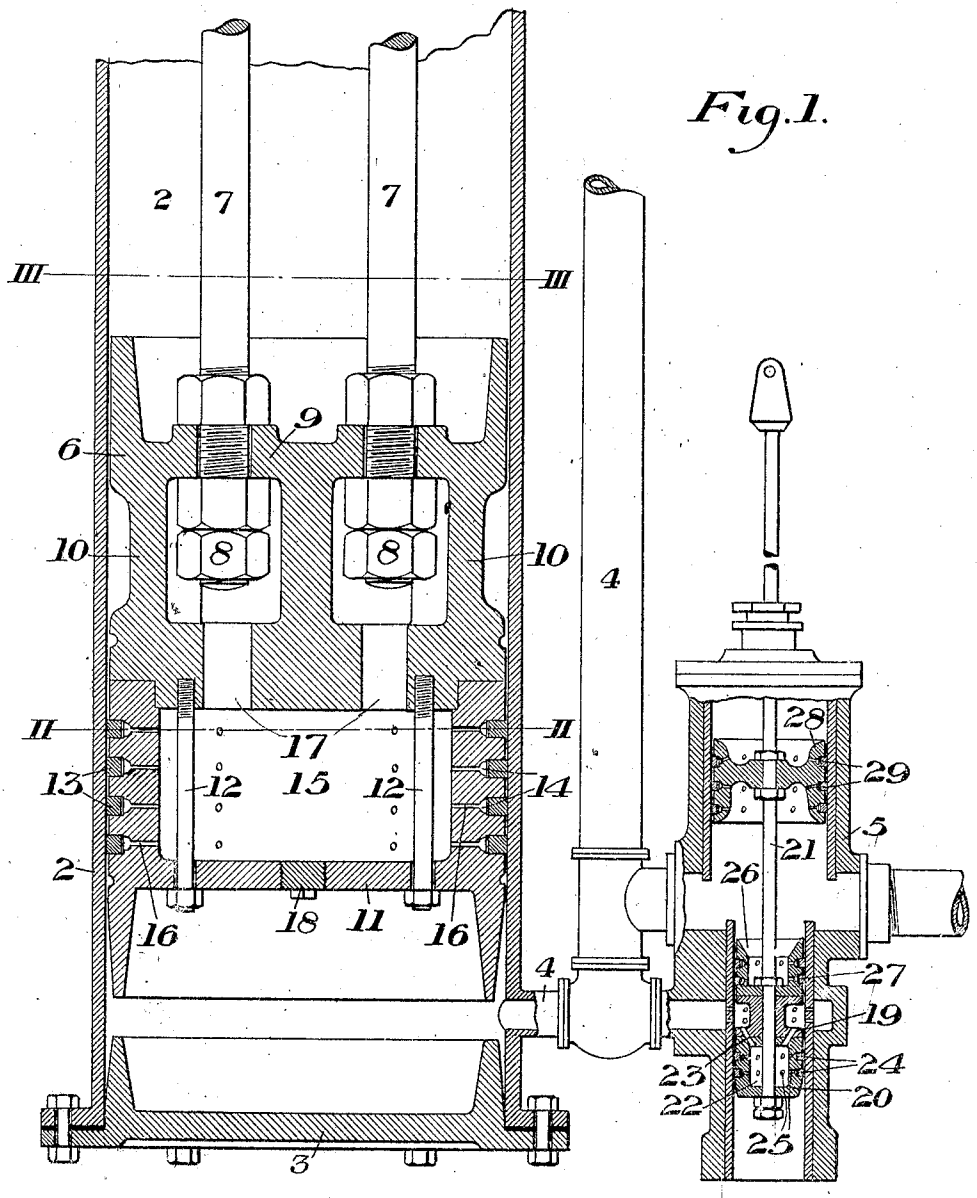
D. H. DYER.

PISTON.

APPLICATION FILED APR. 4, 1907.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 2.

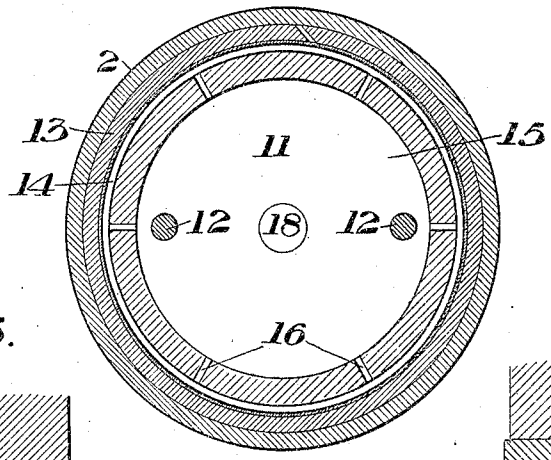


Fig. 5.

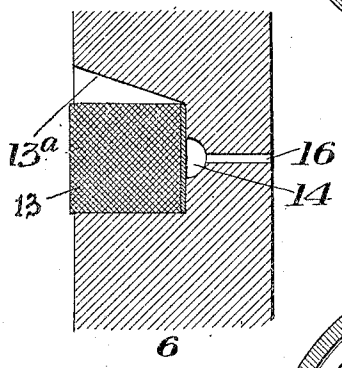


Fig. 4.

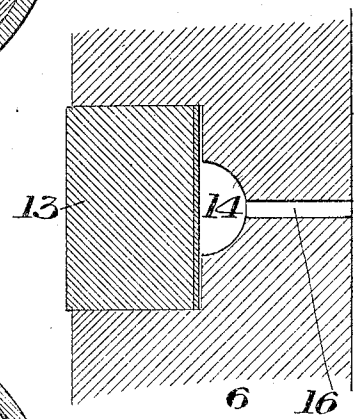
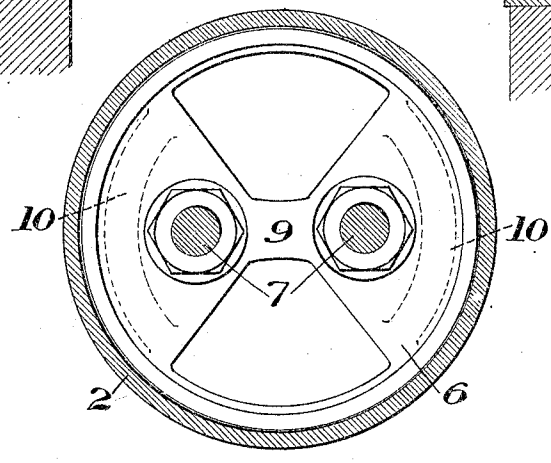


Fig. 3.



WITNESSES

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PISTON.

No. 866,443. Specification of Letters Patent. Patented Sept. 17, 1907.

Application filed April 4, 1907. Serial No. 366,330.

To all whom it may concern:

Be it known that I, DAVID H. DYER, of Wilkinsburg, Allegheny county, Pennsylvania, have invented a new and useful Improvement in Pistons, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical section illustrating my invention; Fig. 2 is a section on the line II—II of Fig. 1; Fig. 3 is a section on the line III—III of Fig. 1; Fig. 4 is an enlarged detail view showing one of the packing rings on its seat, and Fig. 5 is a detail view showing a modified form of packing seat.

My invention has relation to pistons, and more especially to pistons which are designed to be used in connection with hydraulic elevators of the vertical cylinder type.

Heretofore, in the operation of these elevators, great difficulty has been experienced in holding the elevator car stationary at the different floors of the building, by reason of the leakage of the fluid past the piston in the actuating cylinder, a comparatively small leakage sufficient to permit a slight movement of the piston causing a considerable movement of the elevator car. This leakage has been due to rapid wear of the piston packing, and the impossibility of keeping the packing tight in operation.

My invention is designed to overcome this difficulty by providing a piston in which the use of cup leathers is obviated, and simple segmental packing rings are employed, which are forced into engagement with the inner wall of the cylinder by the pressure of the actuating fluid.

My invention also consists in the novel construction of that portion of the piston in which the packing rings are seated whereby it can be readily removed from the body of the piston.

My invention is also applicable to pistons such as are employed in the piston valves and to pistons generally.

Referring to the accompanying drawings, the numeral 2 designates the lower portion of a hydraulic elevator cylinder of the vertical type, having the lower head 3.

4 designates the usual supply pipe, and 5 the usual regulating or controlling valve.

6 designates the body portion of the piston to which are connected the rods 7, by means of the nuts 8, which are seated underneath the top plate or bridge 9 of the piston body which is supported by the segmental lugs 10.

The lower end of the piston body is rabbeted at its edge to receive the detachable lower portion 11, which is secured thereto by means of the bolts 12 or by other suitable means. The outer surface of the portion 12 is formed with a series of surrounding grooves, in which are seated the segmental packing rings 13. The bottoms of the grooves are deepened or enlarged centrally, as indicated at 14, for the purpose of providing an annular pressure chamber behind the rings 13, said chamber being connected with the chamber 15, formed by the hollow interior of the portion 11 and by the piston body which constitutes the top closure therefor, by means of the ports or passages 16. Pressure is admitted to the chamber 15 by means of one or more ports 17 through the piston body.

18 is a removable plug in the bottom wall of the chamber 15 to permit said chamber to be drained and cleaned.

By means of the pressure in the chamber 15 acting through the ports or passages 16, and the pressure chambers 14, the rings 13^a are forced into packing engagement with the walls of the cylinder so tightly that practically all leakage is prevented, this having been demonstrated by me by actual use of these pistons.

In Fig. 5 I have shown a modification in which the upper wall 13^b of the packing ring groove or seat is beveled inwardly, this form being preferred where a fiber packing is used. This packing is initially of substantially the form shown in this figure, and the shape of the wall 13^a permits it to swell after it becomes wet. I have shown the invention also applied to the piston valve 19 of the controller 5. This valve is provided with the detachable hollow head 20, which is secured to the body by means of the rod or stem 21. This head, together with the body of the valve, forms a pressure chamber 22, which is supplied by means of ports 23 leading through the lower portion of the body. Its exterior is provided with packing rings 24 similar to the rings 13 before described, their seats being connected with the chamber 22 by means of the ports 25. I have also shown the upper head 26 of the piston provided with similar packing rings 27, and also the pilot valve 28 with similar rings 29.

The advantages of my invention result from the construction and arrangement whereby the pressure of the actuating fluid is utilized to maintain the seating of the packing rings in the manner described, the provision of the annular pressure chambers 14 insuring uniform pressure at all points, although some of the ports or passages 16 may become choked or closed; and in the construction whereby that portion of the piston carrying said rings may be readily detached from the body of the piston when necessary.

Various changes may be made in the details of construction and arrangement, without departing from the spirit and scope of my invention, since

What I claim is:—

1. A packing section for elevator pistons, comprising a hollow, cylindrical rim member adapted to be secured to a piston head and having a plurality of circumferential packing seats, said member being open at its upper end

and closed at its lower end, and having a plurality of ports or passages leading from its interior to the packing seats; substantially as described.

2. A hydraulic elevator piston comprising a head having a port leading therethrough, and a hollow section having a rim portion fitted and adjustably secured to said head, said hollow section being closed by the head to form a pressure chamber which communicates with the cylinder through the said port; substantially as described.

3. A hydraulic elevator piston comprising a head having a port leading therethrough, and a hollow section having a rim portion fitted and adjustably secured to said head, said hollow section being closed by the head to form a pressure chamber which communicates with the cylinder through the said port, said chamber having a removable plug in its bottom wall; substantially as described.

4. In a hydraulic elevator piston, a piston head having a circumferential groove therein, the upper wall of which is beveled outwardly to provide an expansion space for a packing ring, and means for admitting pressure to the said groove; substantially as described.

In testimony whereof, I have hereunto set my hand.

DAVID H. DYER.

Witnesses:
GEO. H. PARMELEE,
GEO. B. BLEMING.