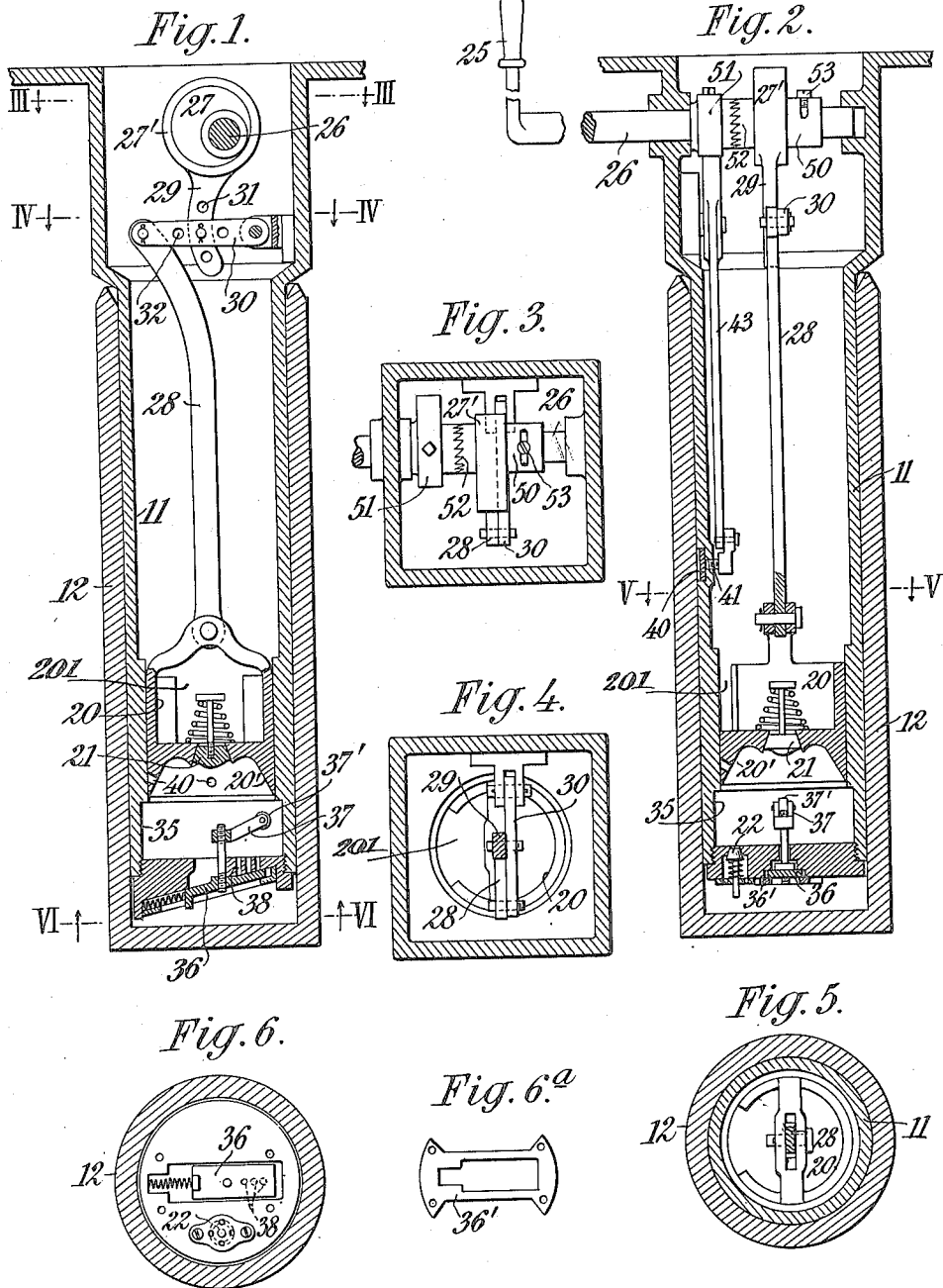


G. C. LARAIA.
HYDRAULIC MECHANISM FOR RAISING AND LOWERING THE SEATS OF CHAIRS AND THE LIKE.
APPLICATION FILED FEB. 24, 1917.

1,255,322.

Patented Feb. 5, 1918.



WITNESSES:
Rene Guine
J. F. Wallace

INVENTOR :
Giuseppe Carmelo Laraia
By Attorneys,
Fraser, Park & Myers

UNITED STATES PATENT OFFICE.

GIUSEPPE CARMELO LARAIA, OF NEW YORK, N. Y.

HYDRAULIC MECHANISM FOR RAISING AND LOWERING THE SEATS OF CHAIRS AND THE LIKE.

1,255,322.

Specification of Letters Patent.

Patented Feb. 5, 1918.

Application filed February 24, 1917. Serial No. 150,654.

To all whom it may concern:

Be it known that I, GIUSEPPE CARMELO LARAIA, a citizen of the United States of America, residing in the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Hydraulic Mechanism for Raising and Lowering the Seats of Chairs and the like, of which the following is a specification.

This invention relates to hydraulic mechanism for raising and lowering the seats of chairs and the like, and aims to provide improvements therein.

The present invention provides improved mechanism for operating the plunger, and improvements in the mechanism for lowering the seat bearing element. These features are shown, but not claimed, in my application Serial No. 10,907, filed February 27, 1915. The invention also provides means for adjusting the action of the handle on the plunger mechanism.

Other features of improvement will be hereinafter set forth.

An embodiment of the invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a vertical sectional view of said embodiment;

Fig. 2 is a vertical sectional view through a plane at ninety degrees (90°) to the sectional plane of Fig. 1;

Figs. 3 and 4 are respectively horizontal sectional views on the line III—III and the line IV—IV of Fig. 1;

Fig. 5 is a horizontal sectional view on the line V—V of Fig. 2;

Fig. 6 is a sectional view on the line VI—VI of Fig. 1.

Fig. 6^a is a detail view of a retaining plate for the slide 36 shown in Fig. 6.

Referring to said drawings, numeral 11 designates a piston which may be attached to the underside of a seat or the like, and which is adapted to fit within a cylinder 12.

The piston 11 is hollow, closed at its lower end, and adapted to contain a liquid, such as oil.

In order to raise the seat, oil is forced from the interior of the piston 11 into the lower end of the cylinder 12. For this purpose a plunger 20 is provided inside of the piston 11. The plunger 20 is provided with a valve 21, opening downwardly, and

adapted to permit oil to pass from the upper face of the plunger to the lower side thereof, and the lower end of the piston 11 is provided with a downwardly opening valve 22 adapted to permit oil to be forced from the piston 11 below the plunger 20 into the lower part of the cylinder 12.

The plunger 20 may be operated by a handle 25 attached to a rock shaft 26, which rock shaft has an eccentric 27 thereon connected to an eccentric strap 27' attached to the plunger 20. The strap 27' is preferably attached to the plunger rod 28 through a lever 30 and an arm 29. The motion of the eccentric is multiplied by the lever 30. The amount of the motion of the lever 30, and consequently the amount of movement of the plunger, may be adjusted by adjusting the connection between the arm 29 and the lever 30, a plurality of holes 31, 32 being provided in the arm and lever respectively.

The means for adjusting the action of the handle on the plunger preferably comprise a sleeve 50 loose upon the shaft 26, a collar 51 fixed upon the shaft 26, and preferably interengaging means, such as teeth 52 upon the adjacent faces of the sleeve 50 and collar 51. Suitable means for maintaining the teeth 52 of the sleeve and collar in engagement, such as a bolt 53, may be provided. The sleeve is slotted to permit the bolt to pass through at different angular dispositions of the sleeve. The collar 51 is preferably formed with a cam surface which actuates a rod 43 connected to a fixing means 40, 41, shown more fully in my aforesaid application. When the handle 25 is in one extreme of its rocking position, the cam on the collar 51 depresses the rod 43 to cause the part 40 to press against the cylinder 12 and fix the cylinder and piston 11 against movement.

In any adjustment of the arm 29 and lever 30, to provide a greater or less extent of movement of the plunger rod 28 for a given arc of movement of the handle 25, it is simply necessary to shift the angular relation of the sleeve 50 and eccentric 27 carried thereby, with relation to the shaft 26 or collar 51 carried thereby. The nearer the high point of the eccentric to the top of the piston, the less will be the amount of movement of the lever 30 (and parts affected thereby) for a given arc of movement of the handle 25. The nearer the high point of

the eccentric to a horizontal plane passing through the axis of the shaft 26, the greater will be the movement of the lever 30 (and parts affected thereby) for a given arc of movement of the handle 25.

By thus shifting the position of the eccentric upon the shaft, and the point of connection of the arm 29 and lever 30, the plunger operating mechanism may be adjusted to best suit the strength and preferences of the person operating the chair.

By rocking the handle 25, the plunger 20 is reciprocated, and oil is forced from the interior of the piston 11 into the lower part of the cylinder 12, and the piston 11 is thus made to rise.

In order to lower the piston an enlargement 35 for the flow of oil is provided at or near the lower end of the piston 11 and a spring-pressed slide valve 36, or other suitable valve, is provided at the lower end of the piston. To lower the chair seat, the handle 25 is moved to its limit in the proper direction, thus bringing a bevel 20' on the lower side of the plunger 20 into a position to contact with an arm 37 on the valve 36 and move the valve 36 to open position. The arm 37 preferably carries an anti-friction roller 37'. In this position of the plunger 20, oil will flow around the plunger 20 through the enlargement 35 and from the cylinder 12 into the piston 11 through one or more passages 38 controlled by the slide valve 36. The plunger 20 is formed with a cut-out portion 201 so arranged that when the bevel portion 20' is in contact with the arm 37 of the valve 36 and one of the holes 38 is uncovered, the lower edge of the cut-out portion 201 is below the upper edge of the enlargement 35, thereby providing a passage for the flow of oil from the lower side of the plunger to the upper side thereof. A plurality of passages 38 is preferably provided. The operator, by regulating the amount of throw of the handle 25, may regulate the movement of the plunger 20, and in consequence the amount of movement of the slide valve, whereby one or more of the passages 38 may be uncovered and the flow of oil controlled. The rate at which the piston 11 descends, may be thus regulated. The plate 36' (Fig. 6^a) fits against the lower face of the piston and retains the slide 36 thereon.

Vents 40 are preferably provided in the beveled lower edge of the plunger to prevent oil being trapped under the lower face of the plunger, when the plunger is resting against the bottom of the piston.

The inventive ideas are capable of other embodiments than those illustrated and specifically described.

What I claim is:—

1. A device of the character described, comprising a hydraulic piston, a cylinder and a pump carried by said piston for

operating said piston, and means for operating said pump comprising a rock-shaft, a handle for operating said rock shaft, and an adjustable lever between said rock-shaft and pump.

2. A device of the character described, comprising a hydraulic piston, a cylinder and a pump carried by said piston for operating said piston, and means for operating said pump comprising a rock shaft, a handle attached to said rock shaft, a lever connected to said pump, and a connection between said rock shaft and lever.

3. A device of the character described, comprising a hydraulic piston, a cylinder, a pump carried by said piston for operating said piston, and means for operating said pump comprising a rock shaft, a handle attached to said rock shaft, a lever connected to said pump, and an adjustable connection between said rock shaft and lever.

4. A device of the character described, comprising a hydraulic piston, a cylinder for said piston, a pump plunger in said piston, a passageway for the passage of liquid from the cylinder to the piston, a slide controlling said passageway, and means on said pump plunger for operating said slide.

5. A device of the character described, comprising a hydraulic piston, a cylinder for said piston, a pump carried by said piston, a plurality of openings between said pump and said cylinder, a slide controlling said openings and means for operating said slide, said slide being operable to vary the number of openings which may be open.

6. A device of the character described, comprising a hydraulic piston, a cylinder for said piston, a pump plunger in said piston, an opening between said piston and cylinder, and a slide valve controlling said opening, and a beveled flange on said pump plunger adapted to move said valve.

7. A device of the character described, comprising a hydraulic piston, a cylinder for said piston, a pump plunger in said piston, a plurality of openings between said piston and cylinder, and a slide valve controlling said openings, said pump plunger being adapted to move said slide valve to varying degrees to vary the amount of opening between said piston and cylinder.

8. A device of the character described, comprising a hydraulic piston, a cylinder for said piston, a pump plunger in said piston, means for operating said plunger, comprising a rock shaft, a handle for operating said rock shaft, and an eccentric upon said rock shaft, and means for fixing said piston in position in said cylinder, comprising a cam on said shaft, and interengaging means on said cam and eccentric, said eccentric being adjustable with relation to said cam.

9. A device of the character described, comprising a cylinder, a hydraulic piston, a

plunger carried by said piston for operating said piston, and means for operating said plunger, comprising a rock shaft, a handle for operating said rock shaft, a collar on said shaft and an eccentric adjustably mounted upon said rock shaft, said collar and eccentric having interengaging means for fixing said eccentric in adjusted position.

10 10. A device of the character described, comprising a cylinder, a hydraulic piston, a plunger carried by said piston for operating said piston, and means for operating said plunger, comprising a rock-shaft, a handle for operating said rock-shaft, a collar on
15 said shaft, an eccentric adjustably mounted

upon said rock-shaft, and means for connecting said collar and eccentric.

11. A device of the character described, comprising a cylinder, a hydraulic piston, a plunger carried by said piston for operating
20 said piston, and means for operating said plunger, comprising a rock shaft, a handle for operating said rock shaft, and an eccentric adjustably mounted upon said rock shaft, a lever between said eccentric and
25 plunger, and an adjustable connection between said lever and eccentric.

In witness whereof, I have hereunto signed my name.

GIUSEPPE CARMELO LARAIA.