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HYDRAULIC LIFT SUPPORT FOR CHAIR

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2 Sheets-Sheet 1

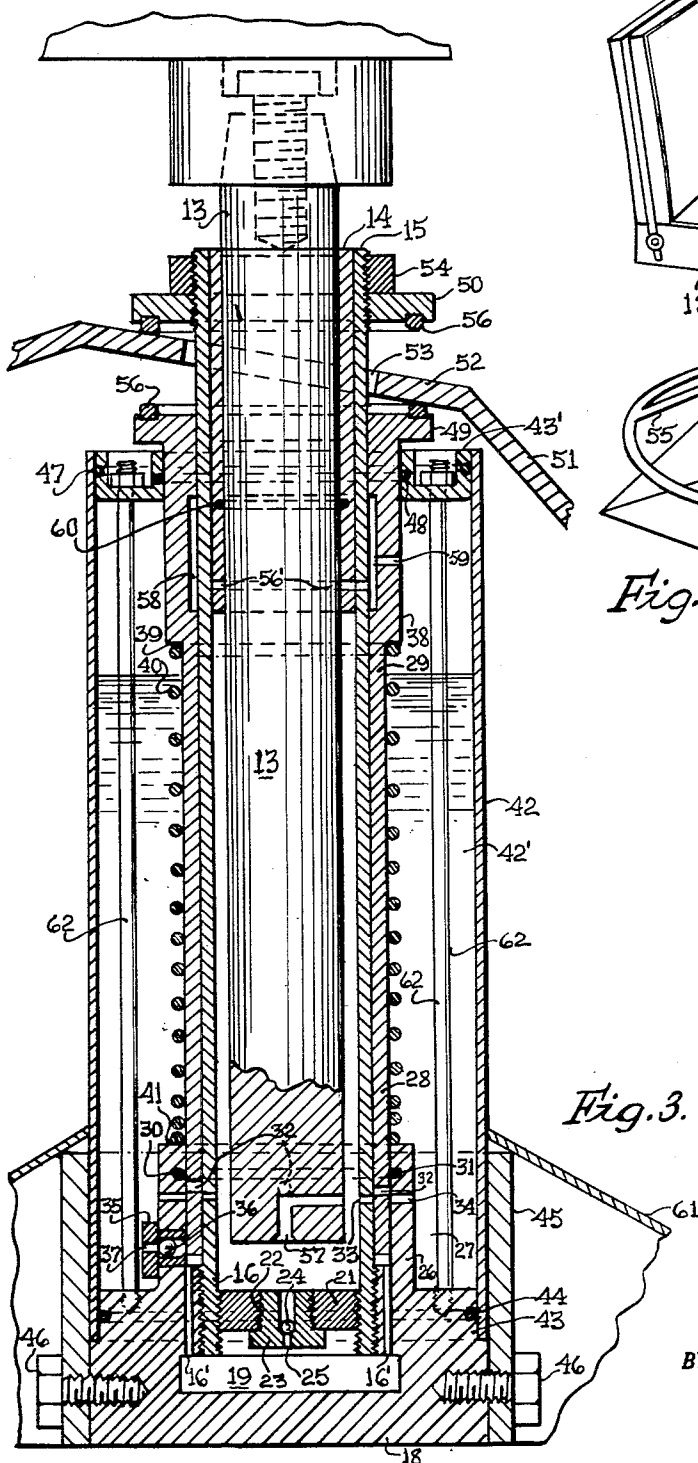


Fig. 3.

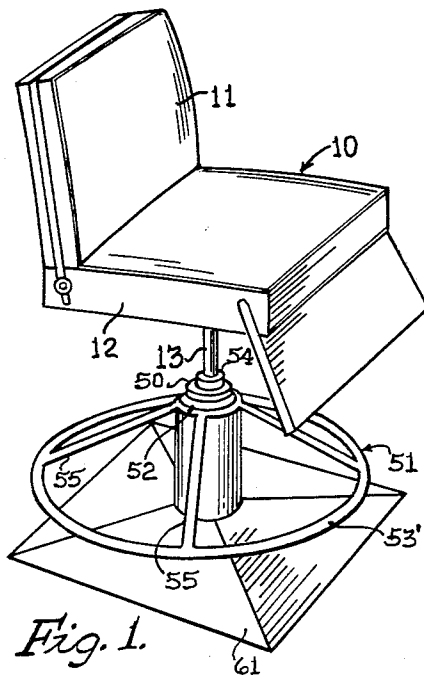


Fig. 1.

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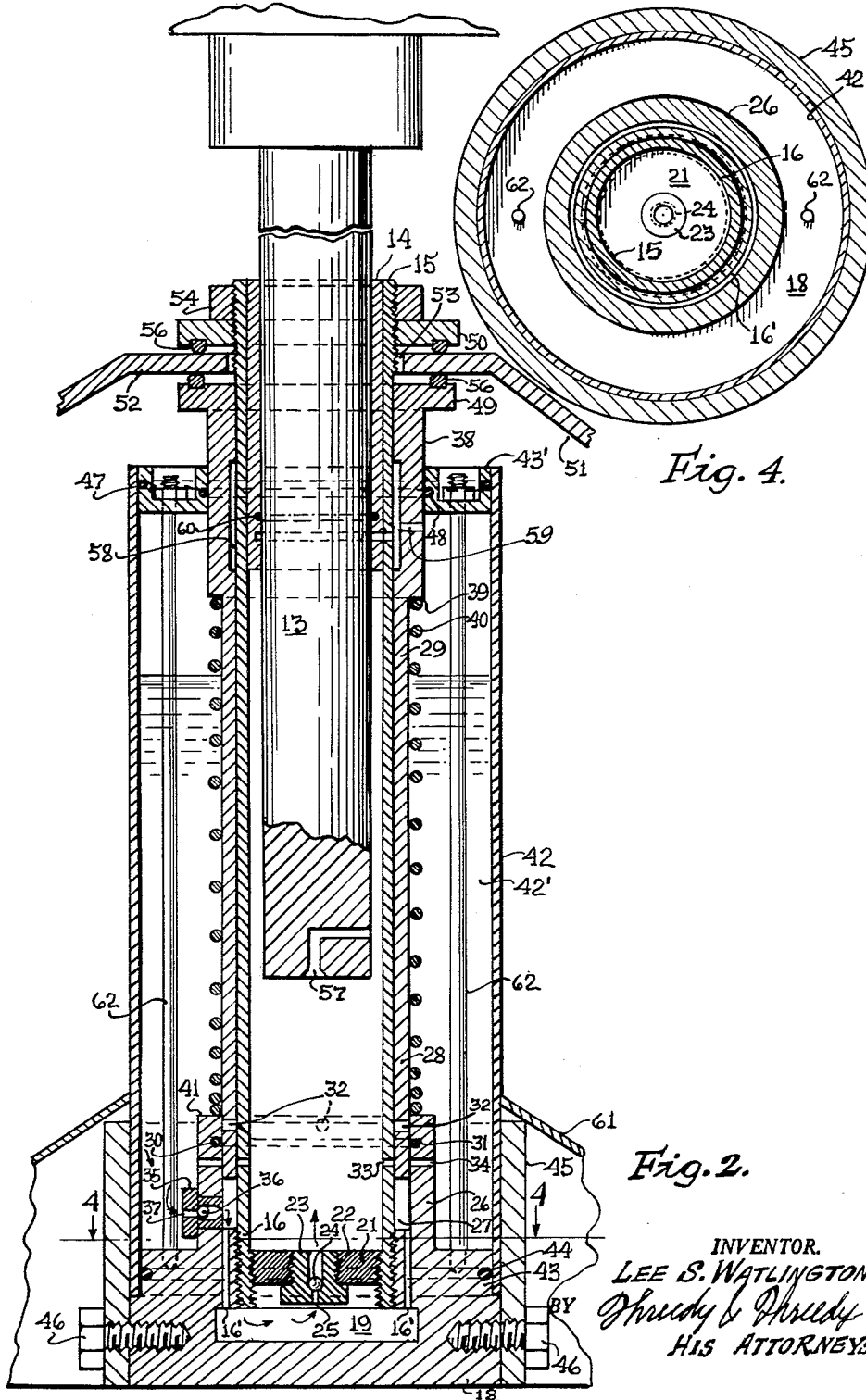


Fig. 2.

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HYDRAULIC LIFT SUPPORT FOR CHAIR

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6 Claims. (Cl. 248-404)

My invention relates to new and useful improvements in a chair especially designed and constructed for use in barber shops, beauty parlors, dentist and doctor's offices, and the like.

A principal object of the invention is to provide an arrangement for manipulating a hydraulic lift for the chair, the lift being operated by the attendant at any point adjacent the chair where the attendant may be standing.

Other objects will appear hereinafter.

The invention consists in the novel combination and arrangement of parts to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings showing the preferred form of construction, and in which:

FIG. 1 is a perspective view of a chair embodying my invention;

FIG. 2 is a fragmentary vertical sectional detail view of the lift mechanism embodied in my invention;

FIG. 3 is a view similar to FIG. 2 showing the mechanism in a different position; and

FIG. 4 is a sectional detail view taken substantially on line 4-4 of FIG. 2.

The preferred form of construction of my invention is shown in the drawings wherein a chair generally indicated at 10 comprises a back rest 11 and a seat 12. The chair is swivelly connected to a plunger 13. The means for accomplishing this connection has not been shown for the reason that any form of construction which will permit the chair to revolve axially with respect to its base, may be used.

The plunger 13 slidably operates in a guide sleeve 14 which is press-fitted into or otherwise secured to the upper end portion of a stationary tubular sleeve 15. This tubular sleeve 15 has its lower end portion 16 threadably connected to a base 18. The base 18 below the lower end portion 16 of the sleeve 15 provides a well 19. Formed in the base 18 are several vertical ports 16' which communicate with the well 19.

The lower end portion 16 of the sleeve 15 is closed by a plug 21 having a central opening 22 formed therein. In the opening 22 there is driven or otherwise secured a check valve 23, the ball valve 24 of which normally closes an opening 25 formed in the check valve 23.

The base 18 provides an upstanding ring 26 surrounding the lower end portion 16 of the sleeve 15 and disposed in spaced relation with respect thereto to provide an annular recess 27 into which slidably projects the lower end portion 28 of a tubular or plunger sleeve cylinder 29. The ports 16' communicate with such recess 27. An O-ring 30 is mounted in a groove 31 to provide an effective seal between the ring 26 and the lower end portion 28 of the cylinder 29. In such lower end portion 28 of the cylinder 29 are radially disposed ports or passages 32 which, under conditions hereinafter explained, are adapted to communicate with escape ports 33 and 34 formed in the ring 26 and the portion 16 of the tubular sleeve 15, respectively.

In the ring 26 at one side thereof and in communication with the well 19 is a check valve 35 having a ball valve 36 which normally closes a port 37. The cylinder 29 has an enlarged upper end portion 38 providing an annular shoulder 39. Embracing the plunger sleeve 29 is a coil spring 40, one end of which engages the shoulder 39 and the opposite end of which engages the top edge 41 of the sleeve 26.

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The cylinder 29 slidably projects through a cap 43' which closes the upper end portion of a tubular shell 42, the lower end portion of the shell 42 receiving a reduced portion 43 of the base 18. A suitable seal 44 is positioned between the reduced portion 43 and the shell 42. The shell 42 provides an oil reservoir 42'. A collar 45 surrounds the base 18 and the lower end portion of the shell 42 and is connected to the base 18 by suitable threaded bolts 46. Suitable seals 47 and 48 are arranged between the cap 43' and the upper end portion of the shell 42 and between the enlarged head portion 38 of the cylinder 29 and the cap 43', respectively.

The enlarged head portion 38 provides a disc 49 spaced from a similar disc 50 carried by the upper end portion of the sleeve 15. A foot plate 51 in the form of a spoked wheel has an opening 53 formed in a hub 52 thereof and of a diameter larger than the outside diameter of the inner tube 15. The disc 50 is threaded on the sleeve 15 for adjustment relative thereto. Such disc is held in an adjustable position by means of a nut 54 threaded thereagainst on the sleeve 15. The foot plate 51 has arms or spokes 55 integrally connecting the hub 52 to a foot ring 53' of the foot plate 51. The opposing faces of the discs 49 and 50 each carry a nylon ring 56.

A recess 58 is formed in the enlarged portion 38 of the cylinder 29. Formed in such enlarged portion 38 are one or more escape ports 59. Formed in the lower end portion of the plunger 13 is an escape passage 57 which, for reasons hereinafter explained, is adapted to communicate with the recess 58 and an escape port 56' when the plunger 13 reaches the limit of its upper movement.

A suitable O ring seal 60 is provided between the guide sleeve 14 and plunger 13. The cap 43' is connected to the base 18 by means of elongated bolts or rods 62. To complete the invention, the base 18 is confined beneath a hood 61 which rests upon the floor.

The plunger 13 of the chair 10 as seen in FIG. 2 is shown in a partially elevated position. To elevate the plunger chair beyond the position shown in FIG. 2, the attendant places his foot upon the foot plate 51 at any point circumferentially with respect thereto. He now slightly rocks the foot plate 51 relative to the sleeve 15. In so doing, the foot plate 51 will bear against the disc 50 and against the disc 49. The disc 50 will remain stationary while the cylinder 29 will be caused to reciprocate by virtue of the rocking of the foot plate 51. As the reservoir 42' and well 19 have been previously filled with oil or other fluid each time that the cylinder 29 is depressed or moved downwardly, oil will be forced through the check valve 23 into the sleeve 15, which sleeve 15 likewise has been previously filled with oil or other fluid. As the oil is forced into the sleeve 15, it will act against the plunger 13 and elevate the chair to a desired height or until the chair seat reaches the limit of its upward movement.

Upon the chair reaching its limit of elevation, the escape port 56' will communicate with the recess 58 and any further rocking action of the foot plate 51 will only cause the additional oil to flow through the port 59 back into the reservoir. In this manner, the limit of the upward movement of the chair 10 is regulated. To lower the chair the attendant will rock the foot plate 51 to its extreme position as shown in FIG. 3, at which time the port 32 will register with the escape ports 33 and 34, permitting the oil within the sleeve 15 to escape back into the well 19, allowing the chair to slowly return to its lowermost position.

By this arrangement I have provided an effective means which may be operated at any point about the chair for elevating a chair in any desired position within the limits of its movement. Such arrangement will reduce the

amount of walking by the attendant around the chair.

The construction is relatively simple and once the reservoir is charged with the oil or fluid, the mere rocking of the foot ring 53' by the operator will effect movement of the chair seat 10. This may be accomplished by the operator at any point where he is standing circumferentially with respect to the chair.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. In combination, a structure comprising an oil reservoir, a stationary cylinder arranged coaxially in said reservoir, a sleeve embracing said cylinder and movable longitudinally with respect thereto, spring means embracing said sleeve for yieldably maintaining said sleeve in one position relative to said cylinder and for permitting movement thereof within said structure, a plunger within said cylinder and movable longitudinally with respect thereto, check valve means carried by said cylinder and operable by the pressure of fluid in said reservoir as it is forced through said check valve means into said cylinder by movement of said sleeve in one direction against said spring means so as to effect intermittent movement of said plunger relative to said sleeve, and a chair seat carried by and movable with said plunger.

2. In combination, a structure comprising an oil reservoir, a stationary cylinder arranged coaxially in said reservoir, a sleeve embracing said cylinder and movable longitudinally with respect thereto, spring means embracing said sleeve for yieldably maintaining said sleeve in one position relative to said cylinder and for permitting movement thereof within said structure, a plunger within said cylinder and movable longitudinally with respect thereto, check valve means carried by said cylinder and operable by the pressure of fluid in said reservoir as it is forced through said check valve means into said cylinder by movement of said sleeve in one direction against said spring means so as to effect intermittent movement of said plunger relative to said sleeve, a chair seat carried by and movable with said plunger, and means provided by said structure at the limits of the upward movement of said plunger to by-pass the fluid from said cylinder into said reservoir.

3. In combination, a structure comprising an oil reservoir, a stationary cylinder arranged coaxially in said reservoir, a sleeve embracing said cylinder and movable longitudinally with respect thereto, spring means embracing said sleeve for yieldably maintaining said sleeve in one position relative to said cylinder and for permitting movement thereof with said structure, said means comprising a substantially circular foot-operated member rockably supported exteriorly of said structure and engageable with said sleeve, a plunger within said cylinder and movable longitudinally with respect thereto, check valve means carried by said cylinder and operable by the pressure of fluid in said reservoir as it is forced through said check valve means into said cylinder by movement of said sleeve in one direction against said spring means so as to effect intermittent movement of said plunger relative to said sleeve, and a chair seat carried by and movable with said plunger.

4. In combination, a structure comprising an oil reservoir, a stationary cylinder arranged coaxially in said reservoir, a sleeve embracing said cylinder and movable longitudinally with respect thereto, means for effecting reciprocatory movement of said sleeve relative to said cylinder, said means comprising a foot-operated member rockably supported by said structure and engageable with said cylinder and said sleeve, a plunger within said cylinder and movable longitudinally with respect thereto, check valve means carried by said cylinder and operable by the pressure of fluid in said reservoir as forced through said check valve means by said sleeve into said cylinder to effect intermittent movement of said plunger relative to said sleeve, a chair seat carried by and movable with said plunger, and means provided by said structure to by-pass said fluid from said cylinder to said reservoir to permit return of said plunger to an initial position with respect to said cylinder.

5. In combination, a structure comprising an oil reservoir, a stationary cylinder arranged coaxially in said reservoir, a sleeve embracing said cylinder and movable longitudinally with respect thereto, means for effecting reciprocatory movement of said sleeve relative to said cylinder, said means comprising a foot-operated member rockably supported by said structure and engageable with said cylinder and said sleeve, a plunger within said cylinder and movable longitudinally with respect thereto, check valve means carried by said cylinder and operable by the pressure of fluid in said reservoir as forced through said check valve means by said sleeve into said cylinder to effect intermittent movement of said plunger relative to said sleeve, a chair seat carried by and movable with said plunger, and a spring embracing said sleeve to move the sleeve in a direction opposite to that moved by said foot-operated member.

6. In combination, a structure comprising an oil reservoir, a stationary cylinder arranged coaxially in said reservoir, a sleeve embracing said cylinder and movable longitudinally with respect thereto, means for effecting reciprocatory movement of said sleeve relative to said cylinder, said means comprising a foot-operated member rockably supported by said structure and engageable with said cylinder and said sleeve, a spring embracing said sleeve to move the sleeve in a direction opposite to that moved by said foot-operated member, a plunger within said cylinder and movable longitudinally with respect thereto, check valve means carried by said cylinder and operable by the pressure of fluid in said reservoir as forced through said check valve means by said sleeve into said cylinder to effect intermittent movement of said plunger relative to said sleeve, a chair seat carried by and movable with said plunger, and means provided by said structure to by-pass said fluid from said cylinder to said reservoir to permit return of said plunger to an initial position with respect to said cylinder.

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