No. 885,843. PATENTED APR. 28, 1908.

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CHAIR.

APPLICATION FILED MAR. 17, 1905.

Fig. 4.

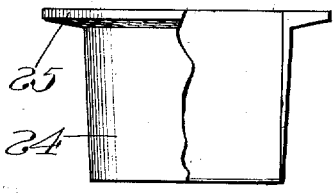



Fig. 3.

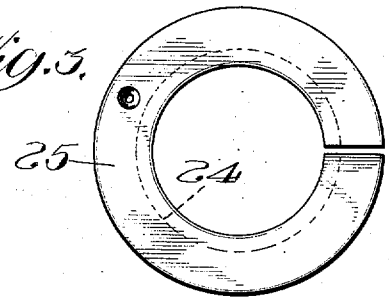



Fig. 1.

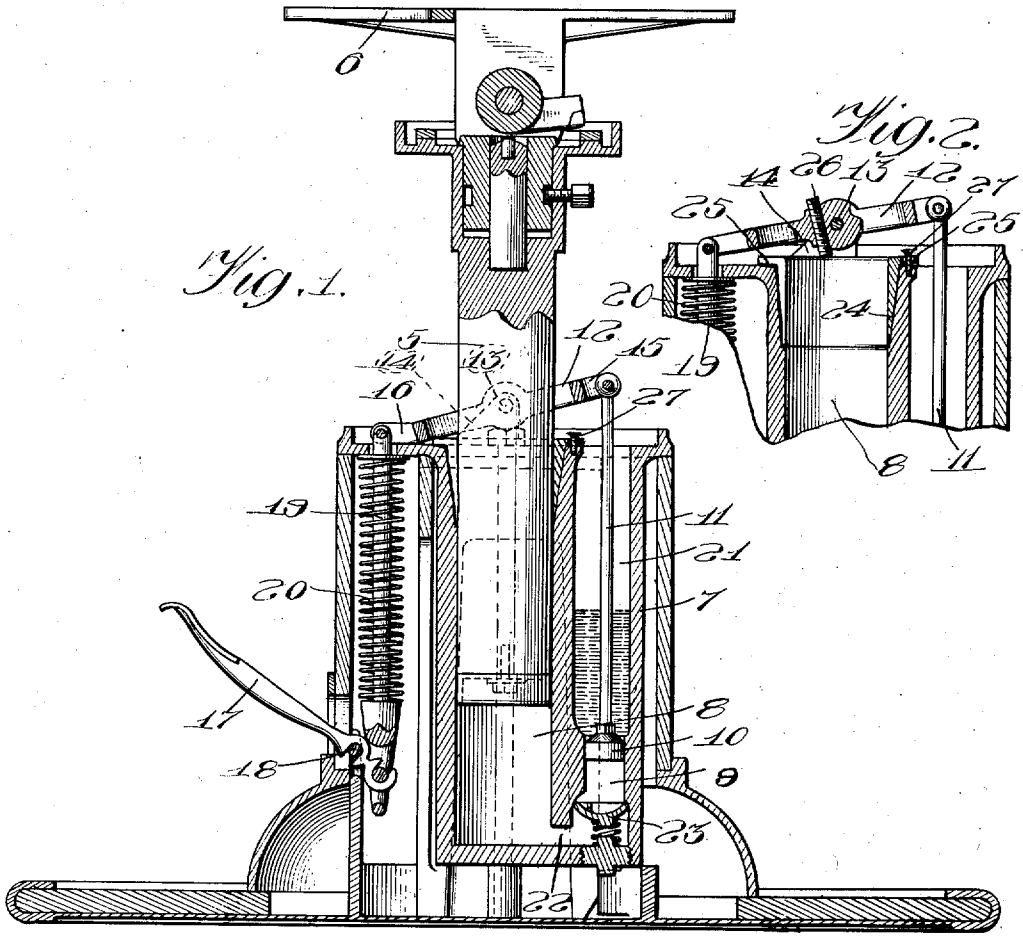



Fig. 2.




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# UNITED STATES PATENT OFFICE.

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## CHAIR.

No. 885,843. Specification of Letters Patent. Patented April 28, 1908.

Application filed March 17, 1905. Serial No. 250,631.

*To all whom it may concern:*

Be it known that we, CHARLES W. FISCHER, CHARLES ZIMMERMAN, and EDWARD C. WALKER, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Chairs, of which the following is a specification, reference being had to the accompanying drawings.

Our invention relates to chairs, and has particularly to do with chairs of the type known as barbers' or dental chairs, in which mechanism is provided for raising and lowering the chair-seat which is arranged to rotate on a suitable base. Our present improvements have to do with such chairs in which the chair seat is raised and lowered by fluid pressure,—such, for example, as that illustrated and described in the pending application of Charles W. Fischer and Charles Zimmerman, No. 199,073, filed March 21, 1904, in which the chair seat is raised by pumping oil into a plunger cylinder in which the plunger which carries the chair seat moves. In such prior constructions the weight of the chair, when elevated, usually is sustained by the fluid in the plunger chamber,—the fluid being held therein by a check valve. While this construction is to a certain extent efficient and satisfactory, we have found that it is desirable that further means be provided for more positively locking the chair in its elevated position so that even if there should be more or less leakage around the check valve the chair may be held in its elevated position, and to provide such additional locking means is one of the principal objects of our invention.

A further object is to provide improved means for locking the chair seat against rotation.

These objects we accomplish as illustrated in the drawings and as hereinafter described.

What we regard as new is set forth in the claims.

In the accompanying drawings,—Figure 1 is a vertical section of the base of a chair, showing also the plunger, parts of which are also in section; Fig. 2 is a sectional detail of the upper portion of the base, the plunger being removed; Fig. 3 is a plan view of the locking sleeve; and Fig. 4 is an elevation thereof, part being broken away.

Referring to the drawings,—5 indicates the plunger of the chair, which carries a seat-support 6.

7 indicates a shell, preferably of cast-iron, which is provided with a plunger-chamber 8, and a piston-chamber 9, arranged side by side, as shown in Fig. 1. The plunger-chamber 8 receives the plunger 5, while the piston-chamber 9 receives a piston 10 carried at the end of a piston-rod 11. The piston-rod is connected at its upper end with a cross-head 12 mounted on suitable pivots 13 which are journaled at the top of the casting 7, at opposite sides of the upper end of the plunger-chamber 8, as illustrated in Fig. 2, in which 14 indicates one of the blocks which carry the bearings for the pivots 13. The cross-head 12 is in the form of a collar having projecting lugs 15—16, and embraces the plunger 5, as shown in Fig. 1.

17 indicates a foot-lever fulcrumed at 18. Said lever is connected by a rod 19 with the lug 16, so that by operating the foot-lever the piston 10 may be reciprocated.

20 indicates a spring mounted on the rod 19 for normally holding the lever 17 in its uppermost position.

As shown at 21 in Fig. 1 the upper portion of the piston chamber 9 is enlarged to form an oil-reservoir.

22 indicates a passage connecting the piston-chamber 9 and plunger chamber 8 at their lower ends.

23 indicates a check valve in the lower portion of the piston-chamber 9 for preventing the return of the oil thereinto from the plunger-chamber.

The construction and operation of the parts thus far described are all set forth in the application of Fischer and Zimmerman, above referred to; and as the details of such construction have nothing to do with our present invention they will not be described more in detail herein. It is sufficient to say that by operating the foot-lever 17 oil is forced from the reservoir 21 into the plunger chamber 8 below the plunger, thereby elevating the plunger and chair seat. The check valve 23 prevents the return of the oil, except when the foot-lever is pressed down to its lowest position when the piston 10 engages the check valve and presses it down off its seat, thereby permitting the oil to escape from the plunger-chamber back into the reservoir 21,—consequently lowering the chair seat.

For the purpose of positively locking the plunger against downward movement whenever it is raised, and also for locking the chair against rotation, we provide a split sleeve 24 having a peripheral flange 25 at its upper end. The inner surface of the sleeve 24 is of uniform diameter, but it tapers gradually in thickness towards its lower edge where it is thinnest. Said sleeve, when its split ends are in contact, is slightly less in diameter than the plunger, so that it may be caused to closely grip the plunger, as hereinafter described. As shown in Figs. 1 and 2, said sleeve is fitted into the upper end of the central portion of the shell 7 which forms the plunger-chamber 8 and which is suitably tapered to receive it, the flange 25 projecting over the top of the shell 7, as shown.

The sleeve 24 is made of cast-iron, or other suitable material, sufficiently elastic to permit of the necessary contraction and expansion. The sleeve 24 normally binds on the plunger closely enough so that it is lifted slightly when the plunger is forced up, and in order to press the sleeve 24 down into operative position, one or more pins 26 are provided in the cross-head 12,—preferably one adjacent to each pivot 13,—which pins are made in the form of screws so as to be adjustable toward and from the flange 25 on the sleeve 24 over which they lie. As shown in Fig. 2, the parts are adjusted so that when the foot-lever 17 is in its uppermost position the pins 26 engage the sleeve 24 and hold it down in the lower portion of its socket, thereby causing it to bind closely upon the plunger. When, however, the foot-lever is operated to raise the plunger, the collar 12 is caused to rock,—the pin or pins 26 being alternately moved into and out of contact with the sleeve 24. As the movement of the lever 17 which forces oil into the plunger-chamber below the plunger, also carries the pins 26 away from the sleeve 24, it will be apparent that said sleeve may rise slightly with the plunger, but the return stroke of the lever 17 carries the pins 26 again into engagement with the sleeve forcing it down closely into operative engagement with the plunger. The result is that the plunger is locked against reverse movement during each return stroke of the operating lever, thus preventing the plunger from settling back, to any appreciable extent, upon such return stroke, as usually occurs with constructions heretofore in use. When the plunger is to be lowered, the lever 17 is depressed to its lowermost point, and the pins 26 are thereby held out of engagement with the sleeve 24, which accordingly is not forced down closely into contact with the plunger,—which may accordingly descend. Furthermore, when the sleeve 24 is in operative position, by reason of its frictional engagement with the shell 7, it locks the plunger and seat against rotation.

27 indicates an adjustable stop—preferably a screw—which is fitted in the upper end of the shell 7 and passes through a suitable hole in the flange 25 above which it projects, as shown in Fig. 2. Said stop underlies the cross head 12 at the opposite side of the pivot 13 from the pins 26—preferably adjacent to the piston-rod 11, as shown, and serves to prevent the cross head 12 from striking the flange 25 and forcing the sleeve 24 down while the plunger is rising.

Having thus described specifically the embodiment of our invention illustrated in the accompanying drawings, we wish to be understood that our invention is not restricted to such particular construction, but includes generically the subject-matter of the broader claims. Moreover, while our invention is designed primarily to be applied to chairs having fluid-pressure mechanism for raising the seat, it may be applied to any other construction to which it is adapted, and, indeed, may also be applied to other devices than chairs. Furthermore, owing to the fact that the locking device is positively moved into operative position, and does not depend upon gravity, it may be applied to plungers, or equivalent devices, which move in other planes than the vertical, and it should be understood, therefore, that the terms "elevating" and "descending" or synonymous terms herein employed, are to be construed accordingly.

That which we claim as our invention and desire to secure by Letters Patent is,—

1. The combination of a plunger, a chamber in which said plunger moves, means for elevating said plunger, and a split sleeve at the upper end of said chamber and surrounding said plunger, said sleeve being actuated by said plunger elevating mechanism to lock the plunger against descent.

2. The combination of a plunger, a chamber in which said plunger moves, a cross-head, a lever connected with one arm of said cross-head, means connected with the other arm of said cross-head for raising the plunger, and a split sleeve at the upper end of said chamber surrounding said plunger, said cross-head having means adapted to depress said split sleeve on each alternate stroke of the lever.

3. The combination of a plunger, a chamber in which said plunger moves, a cross-head, a lever connected with one arm of said cross-head, means connected with the other arm of said cross-head for raising the plunger, and a split sleeve at the upper end of said chamber surrounding said plunger, said cross-head having adjustable means adapted to depress said split sleeve on each alternate stroke of the lever.

4. The combination of a plunger, a plunger chamber, a split sleeve at the upper end of said plunger chamber surrounding said

plunger, and lever actuated mechanism for forcing fluid into said plunger chamber below the plunger and operating to move said sleeve into operative engagement with the plunger.

5. The combination of a plunger, a plunger chamber, a split sleeve at the upper end of said plunger chamber surrounding said plunger, and lever actuated mechanism for forcing fluid into said plunger chamber below the plunger and operating to move said sleeve into operative engagement with the plunger at each alternate stroke of the lever.

6. The combination of a plunger, a plunger chamber, means adapted to engage said plunger to lock it at any point against descent, a lever, means actuated by the movement of said lever in one direction for forcing liquid below said plunger to elevate the same and a spring adapted to move said lever in the opposite direction for moving said locking means into operative engagement with the plunger.

7. The combination of a plunger, a plunger chamber, a split sleeve mounted on said plunger at the upper portion of said plunger chamber, a rocking cross-head adjacent to said split sleeve, a lever for rocking said cross-head, means connected with said cross-head for forcing liquid into said plunger chamber below the plunger, and means carried by the cross-head for moving said split sleeve into operative engagement with the plunger.

8. The combination of a plunger, a plunger chamber, a split sleeve mounted on said plunger at the upper portion of said plunger chamber, a rocking cross-head adjacent to said split sleeve, a lever for rocking said cross-head, means connected with said cross-head for forcing liquid into said plunger chamber below the plunger, means carried by the cross-head for moving said split sleeve into operative engagement with the plunger when the lever is raised, and a stop for preventing the engagement of said cross-head with said sleeve when the lever is depressed.

9. The combination of a plunger, a split sleeve embracing said plunger, a suitable support in which said plunger moves, said support having a socket adapted to receive said sleeve and force the same into locking engagement with said plunger, fluid-pressure mechanism for elevating the plunger, and means for moving said sleeve into operative engagement with said plunger between successive strokes of said fluid-pressure mechanism.

10. The combination of a plunger, a chamber in which said plunger moves, a lever provided with means for elevating said plunger, a split sleeve surrounding said plunger, and a spring adapted to actuate said lever when the lever is released to cause said split sleeve to operatively engage said plunger to lock it against descent.

11. The combination of pump mechanism comprising a chair-supporting plunger, a lever, means actuated by said lever for elevating the plunger, and a chamber in which said plunger moves, a wedge for engaging said plunger to lock it against descent, and means positively actuated by the pump mechanism for moving said wedge to cause it to lock said plunger against descent when said lever is released.

12. The combination of pump mechanism comprising a chair-supporting plunger, a lever, means actuated by said lever for elevating said plunger, and a chamber in which said plunger moves, a split sleeve surrounding said plunger and means positively actuated by said pump mechanism for causing said split sleeve to engage said plunger to lock it against descent when said lever is released.

13. The combination of a plunger, a plunger chamber, means adapted to engage said plunger to lock it against descent, a lever, a spring adapted to move said lever in one direction for moving said locking means into operative engagement with the plunger, and means actuated by the movement of said lever in the other direction for elevating the plunger and releasing said locking means.

14. The combination of a plunger, a plunger chamber, a lever, means positively actuated by the movement of said lever in one direction to the limit of its motion for locking said plunger against descent, means actuated by the movement of said lever in the other direction for elevating the plunger, and a spring normally holding said lever in its plunger-locking position.

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