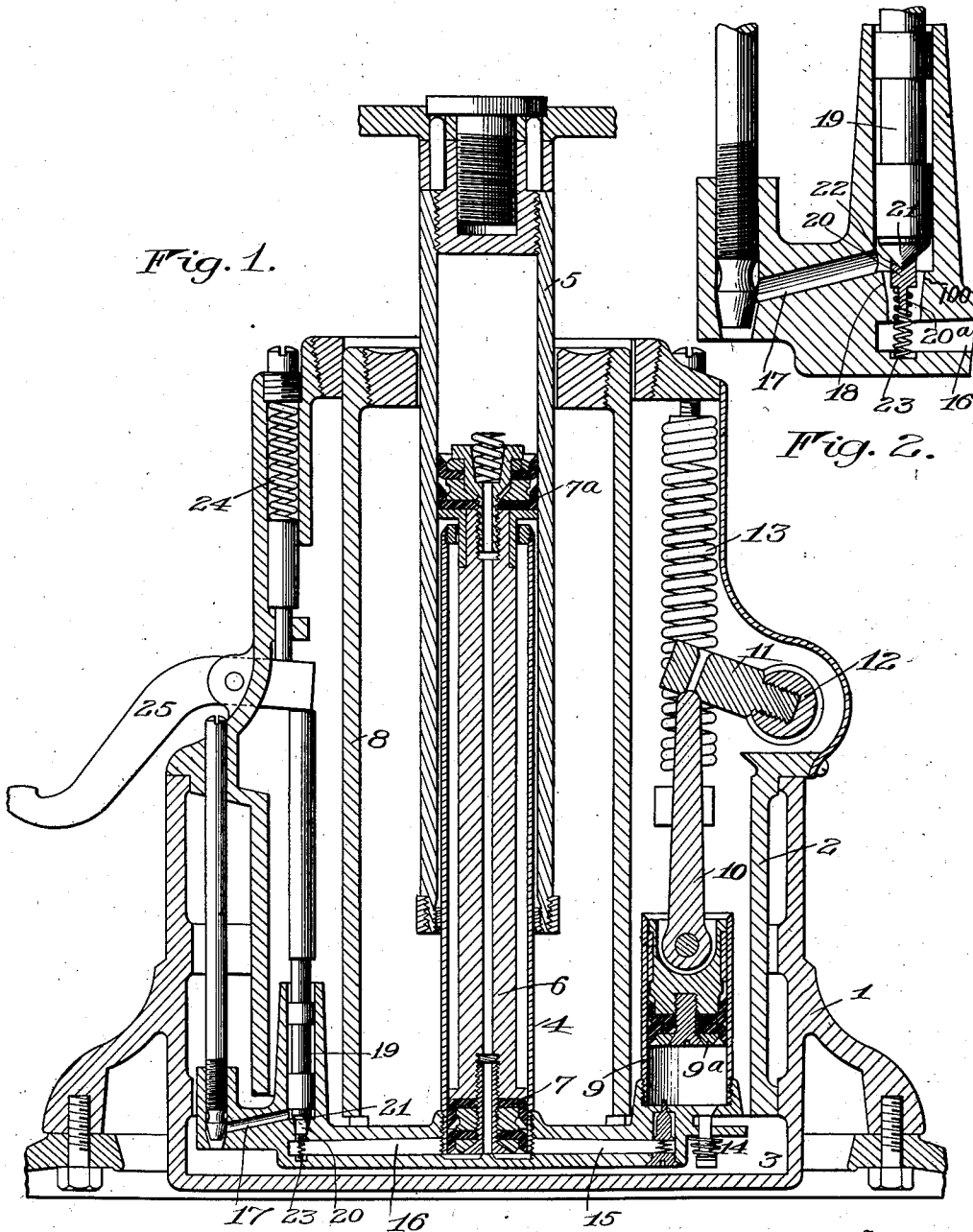


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VALVE MECHANISM FOR DENTAL OR OTHER SIMILAR CHAIRS.
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Patented Nov. 1, 1910.



Witnesses

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VALVE MECHANISM FOR DENTAL OR OTHER SIMILAR CHAIRS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FRANK RITTER, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Valve Mechanism for Dental or other Similar Chairs; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

The present invention relates to the elevating mechanism for adjusting chairs such as surgical, dental or barber chairs in which vertical movement is obtained by means of a fluid medium which is supplied to the telescopic elevating sections by a suitable pump and it has for its object to provide a simple valve mechanism for regulating the escape of the fluid and controlling the descent of the chair in a manner that the descent may be checked and the downward movement of the parts arrested gradually thus avoiding the inconvenience and annoyance of the jarring action which occurs when said movement is stopped suddenly.

To these and other ends the invention consists in certain improvements and combinations of parts all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings: Figure 1 is a vertical sectional view showing a chair elevating mechanism and illustrating in connection therewith a valve mechanism embodying my present invention, and Fig. 2 is an enlarged detail sectional view thereof.

The invention, which is capable of being embodied in chair elevating mechanisms of different types, is shown herein as employed for controlling the mechanism illustrated in Letters Patent No. 762,086, granted to me June 7th, 1904, and is arranged within a base 1 and a pedestal 2 journaled thereon. Arranged on the rotary portion of the base is the fluid-operated elevating stationary cylinder 4 with the coöperating elevating cylinder 5 adapted to support the seat of the chair, the cylinders being connected by a tubular intermediate section 6 provided with the pistons 7 and 7^a. When the elevating cylinder 5 is projected it is supported by a guiding section 8 of the chair base.

In order to cause an upward movement of

the elevating devices with the chair mounted thereon, a pump is provided which draws liquid from the chamber or reservoir 3, formed within the base, and compresses it within the cylinder. In the present instance the pump comprises a cylinder 9 and a piston 9^a reciprocated by a pitman 10 which is retracted by a spring 13 and is moved in the other direction by an arm 11 on a rock shaft 12 operated by the usual treadle arranged on the exterior of the base as will be understood. The pump cylinder communicates with the chamber 3 through a check valve 14, and is connected by a conduit 15 with the stationary cylinder 4.

The descent of the chair is controlled by a valve such as plunger 19, which normally closes the discharge or outlet passage 16 leading from the cylinder 4 from whence the oil or other liquid is allowed to escape into the reservoir or fluid chamber. In elevating mechanisms of this kind it is customary to hold the valve 19 closed by a spring such as 24 and to release it by removing the tension of the spring by means of a foot lever or treadle 25, the hydrostatic pressure on the valve causing the latter to open the passage. The speed of descent of the parts may be controlled by the distance valve 19 is allowed to open but in practice this is governed by the discharge opening at the extremity of the passage 17 by a screw plug as shown.

It is desirable to regulate the discharge from the elevating sections in such a manner that a gradual stop of the chair is obtained, as the valve 19 alone, when it closes, gives a sudden stop thus subjecting the occupant to the inconvenience of a jar. For this purpose I provide a tapering port 18 in the conduit leading from the cylinder 4 to the fluid chamber or reservoir, the conduit being formed by passages 16 and 17, and the plunger or valve 19 acting to close the conduit by seating at 100 at the larger end of the port. Located within this port 18 is a controlling member preferably in the form of a cylindrical device 20 having a diameter slightly smaller than the smallest diameter of the port. This cylindrical member is preferably separate from the plunger and has a loose connection therewith in order that it may properly center itself in the port, but it is preferably held against displacement by a tapering portion 21 on the plunger which enters a tapered socket 22 in the

cylindrical member, the engagement between these faces being maintained by a helical spring 23 seating in the bottom of passage 16 bearing against the member and about
5 a guide stud 20^a thereon. This spring also prevents the cylindrical member dropping through the lower end of the port.

Normally the cylindrical member 20 lies in the narrow portion of the port while the
0 larger end of the latter is closed by plunger 19, the plunger and member 20 being held in these positions by a spring 24 which acts on an operating lever 25. Upon the depression of the lever 25 the pressure of the fluid
5 in passage 17 and also the spring 23 tend to elevate the plunger and the cylindrical member, and when the lever is released the spring 24 moves to effect the closing of the discharge passage, the closing action taking
0 place very gradually as the cylindrical member gradually restricts the passageway through the port.

A chair constructed in accordance with this invention can have its descent checked
5 gradually and by reason of this does not subject the occupant to the annoyance of the jar caused by a sudden stop. Owing to the cylindrical formation of the member 20 and the upward flaring of the port 18 it is im-
0 possible for small particles such as iron filings to collect in the port and interfere with the operation of the valve, as anything passing the lower edge of the member will be carried completely from the port by the flow
5 of the fluid.

I claim as my invention:

1. The combination with a conduit formed with a tapering port, of a valve arranged to seat at the larger end of the port, and a
0 cylindrical member controlled by the valve and lying within the tapered portion when the valve is seated against the larger end of the port.

2. The combination with a base formed
5 with a fluid chamber, of fluid-operated elevating sections, a pump for supplying fluid from the base chamber to the sections, a conduit conducting the fluid from the sections to the base chamber, formed with a
0 tapering port and a seat at the larger end of the port, a plunger adapted to engage the seat at the larger end of the port, and a cylindrical member arranged at the end of the plunger and lying within tapered portion of the port when the plunger engages
5 the seat, and having a diameter slightly smaller than the diameter of the narrowest portion of the port.

3. The combination with a base formed
0 with a fluid chamber, of fluid operated elevating sections, a pump for supplying fluid from the base chamber to the sections, a conduit conducting the fluid from the sections

to the base chamber formed with a tapering port and a seat at the larger end of the port, 65 a member operating in the tapering port and having a diameter slightly smaller than the diameter of the narrowest portion of the port, and a valve to coöperate with the seat at the larger-end of the port while the member lies in the tapered portion and loosely engaging the said member, to permit the latter to be deflected laterally by any small article within the port so that the valve will seat properly. 70 75

4. The combination with a base formed with a fluid chamber, of fluid-operated elevating sections, a pump for supplying fluid from the base chamber to the sections, a conduit conducting the fluid from the sections 80 to the base chamber formed with a tapering port and a seat at the larger end of the port, a member operating in the port and having a diameter slightly smaller than the diameter of the narrowest portion of the port and formed with a tapered socket, and a plunger having a tapered end seated in the socket and coöperating with the seat at the larger end of the tapered port, while the member lies within the tapered port. 85 90

5. The combination with a base formed with a fluid chamber, of fluid-operated elevating-sections, a pump for supplying fluid from the base chamber to the sections, a conduit conducting the fluid from the sections 95 to the base chamber, formed with a tapering port and a seat at the larger end of the port, a valve coöperating with the seat at the larger end of the port, a cylindrical member operating in the port to control it and lying within said port while the valve is coöperating with its seat, and a spring acting to hold the cylindrical member loosely against the valve. 100

6. The combination with a base formed 105 with a fluid chamber, of fluid-operated elevating-sections, a pump for supplying fluid from the base chamber to the sections, a conduit conducting the fluid from the sections to the base chamber formed with a tapering port and a seat at the larger end of the port, a member operating in the port and having a diameter slightly smaller than the diameter of the narrowest portion of the port and formed with a tapered socket, a 110 plunger having a tapered end seated in the socket and engaging the seat at larger end of the tapered port while the said member lies within the tapered portion, and a spring acting on the cylindrical member to hold it 115 120 against the plunger.

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Witnesses:

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