

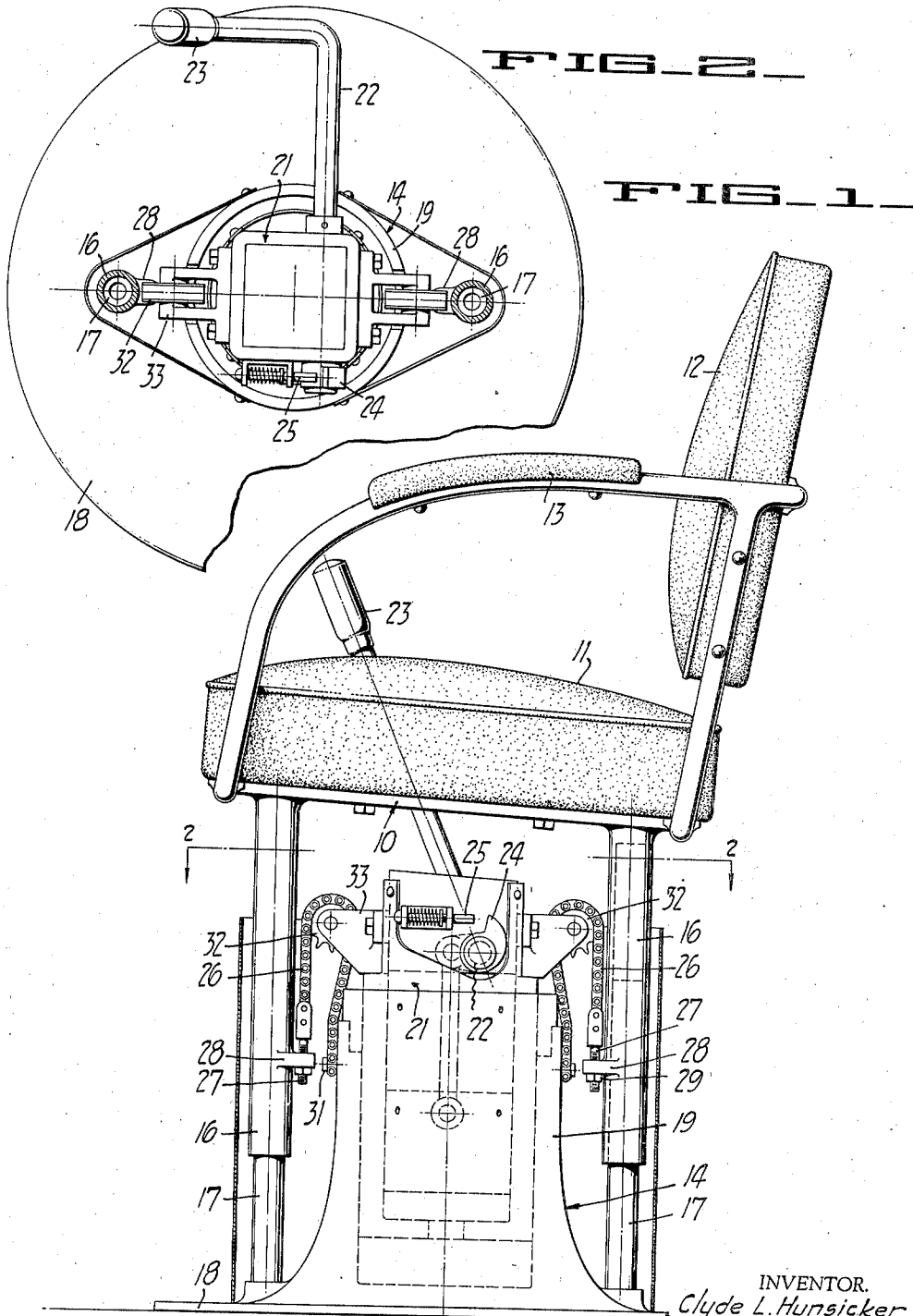
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ADJUSTABLE CHAIR

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ADJUSTABLE CHAIR

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2 Claims. (Cl. 155—94)

This invention relates generally to the construction of chairs capable of raising and lowering adjustments. Such chairs are widely used in professional and semi-professional offices, in order to place a patient at a desired elevation.

It is an object of the invention to provide a chair of the above character which will have a relatively large range of adjustment, but which at the same time can be lowered to a position convenient for children or patients of short stature.

Another object of the invention is to provide a simple type of mechanism for the raising and lowering of chairs, which will offer a wide range of vertical adjustment, without undue mechanical complications.

Further objects of the invention will appear from the following description in which the preferred embodiment of the invention has been set forth in detail in conjunction with the accompanying drawing.

Referring to the drawing:

Fig. 1 is a side elevational view, partly in cross-section, illustrating a chair incorporating the present invention.

Fig. 2 is a cross-sectional view taken along the line 2—2 of Fig. 1.

The chair illustrated in the drawing consists generally of a seat structure 10, which may be of more or less conventional design. As illustrated the seat structure includes a metal frame carrying the cushions 11 and 12, and the arm rests 13. Disposed beneath this seat structure there is a hydraulic operator designated generally by numeral 14, but contrary to conventional construction this hydraulic operator is not directly connected to the seat structure.

In order to guide the seat structure for movements in a vertical direction, two sets of telescopic members 15 and 17 are provided. Members 16 are in the form of tubes or pipes having their upper ends secured to the frame of the seat structure. Members 17 are also in the form of tubes or pipes slidably engaged within the tubes 16, and having their lower ends rigidly secured to the base structure 18.

The hydraulic operator 14 consists of a stationary part 19, which can be in the form of a casting, and a hydraulic plunger 21 which is slidably fitted within the part 19. The control shaft 22 extends laterally as shown in Fig. 2 and is provided with an operating handle 23. One end of the shaft 22 is shown provided with a finger 24, which engages the spring pressed plunger 25, as the handle 23 is swung in a counterclockwise direction as viewed in Fig. 1. Hydraulic

operators of this kind are well known by those skilled in the art, and need not be described in detail. By oscillating handle 23 a pump means is operated to introduce liquid under pressure into a cylinder, thereby raising the plunger 21 by hydraulic pressure. By swinging the handle 23 to the limit of its movement in a counterclockwise direction as viewed in Fig. 1, a liquid by-pass is opened permitting the liquid to flow out from the previously mentioned cylinder, thereby permitting the plunger 21 to lower. In the past it has been quite customary, as previously pointed out, to mount the frame of the chair directly upon the upper end of the hydraulic plunger 21.

In the present instance, motion multiplying means connects the plunger 21 with the seat structure, and this means makes use of a pair of flexible cables or chains 26. One end of each chain is shown secured to a threaded screw 27, and this screw in turn extends through an opening in an anchoring tab 28. By means of a nut 29, which engages the screw 27, some latitude of adjustment is afforded. Each of the tabs or lugs 28 is carried by the corresponding tubular member 16. The other end of each chain 26 is anchored to the stationary casting 19 of the hydraulic operator, as indicated at 31. Both of the chains 26 engage over sprocket wheels 32, and these wheels in turn are suitably mounted upon the hydraulic plunger 21. Thus each sprocket wheel is journaled to a bracket 33, and each bracket in turn is secured to the hydraulic plunger 21.

Operation of my chair can be briefly outlined as follows: The seat structure is supported by tension on the chains 26. When the hydraulic plunger 21 is raised or lowered a given amount by manipulation of the handle 23, such movement is imparted to the seat structure through the chains 26, and the amount of the movement imparted is double the movement of the plunger 21. In other words if the hydraulic plunger 21 has an amplitude of movement of about four inches, the chair will have an amplitude of adjustment of about eight inches. It will be evident that such an arrangement makes possible a chair which can be adjusted to a relatively low level for children or persons of short stature, and at the same time it can be adjusted over a relatively wide latitude. Although the hydraulic mechanism employed can be relatively compact and short as to over-all height, it is made capable of elevating the seat structure to a height such as might be attained by a substantially 55

larger sized hydraulic structure directly connected to the seat structure. The mechanism employed is relatively simple, and there is little if any likelihood of mechanical failure.

5 I claim:

1. In a chair, a seat structure, a hydraulic operator unit underlying the seat structure, said operator unit including a fixed part and a plunger movable in a vertical direction, motion multiplying means connecting the plunger with said
10 seat structure, said motion multiplying means including at least two flexible elements having their ends secured respectively to the seat structure and to the fixed part of the hydraulic operator, means movable by said plunger for operating said flexible elements, and two sets of vertically disposed guiding means, each set being disposed to one side of the operator unit and having no rigid connection to the movable part
15 of said unit, said devices serving to guide the seat structure independently of the operator unit for movements of the seat structure in a vertical direction.

2. In a chair, a seat structure, guide means

serving to support the seat structure for movements of the same in a vertical direction, said guide means including at least two sets of guide members with each set comprising slidably and telescopically engaged parts, a hydraulic operator unit disposed below the seat structure, said operator unit including a fixed part forming the base for the chair, and also including a hydraulic plunger movable hydraulically in a vertical direction, said two sets of guide members being
10 disposed in spaced relationship on opposite sides of the hydraulic operator unit and being secured to the fixed part of the hydraulic operator, a pair of sprockets carried by the hydraulic plunger, a pair of chains engaged over said sprockets,
15 one end of each chain being effectively connected to the seat structure and the other end of each chain being anchored to the fixed part of the hydraulic operator, whereby when said plunger is moved hydraulically in a vertical direction, amplified movement in a vertical direction is imparted to the seat structure.

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