Sept. 2, 1958 H. V. THADEN 2,850,076

VERTICALLY ADJUSTABLE CHAIR

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Fig. 1.

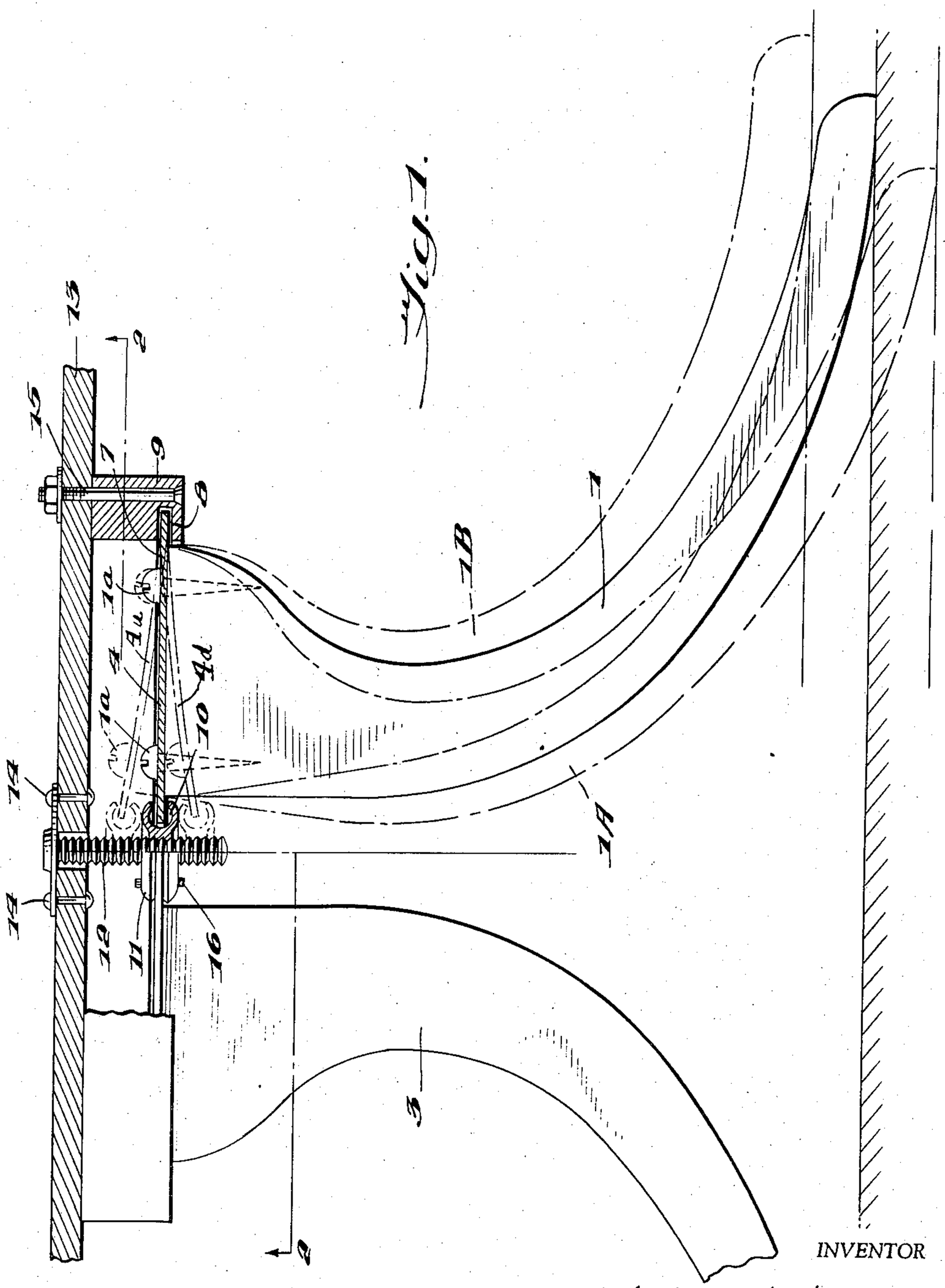

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Fig. 2.

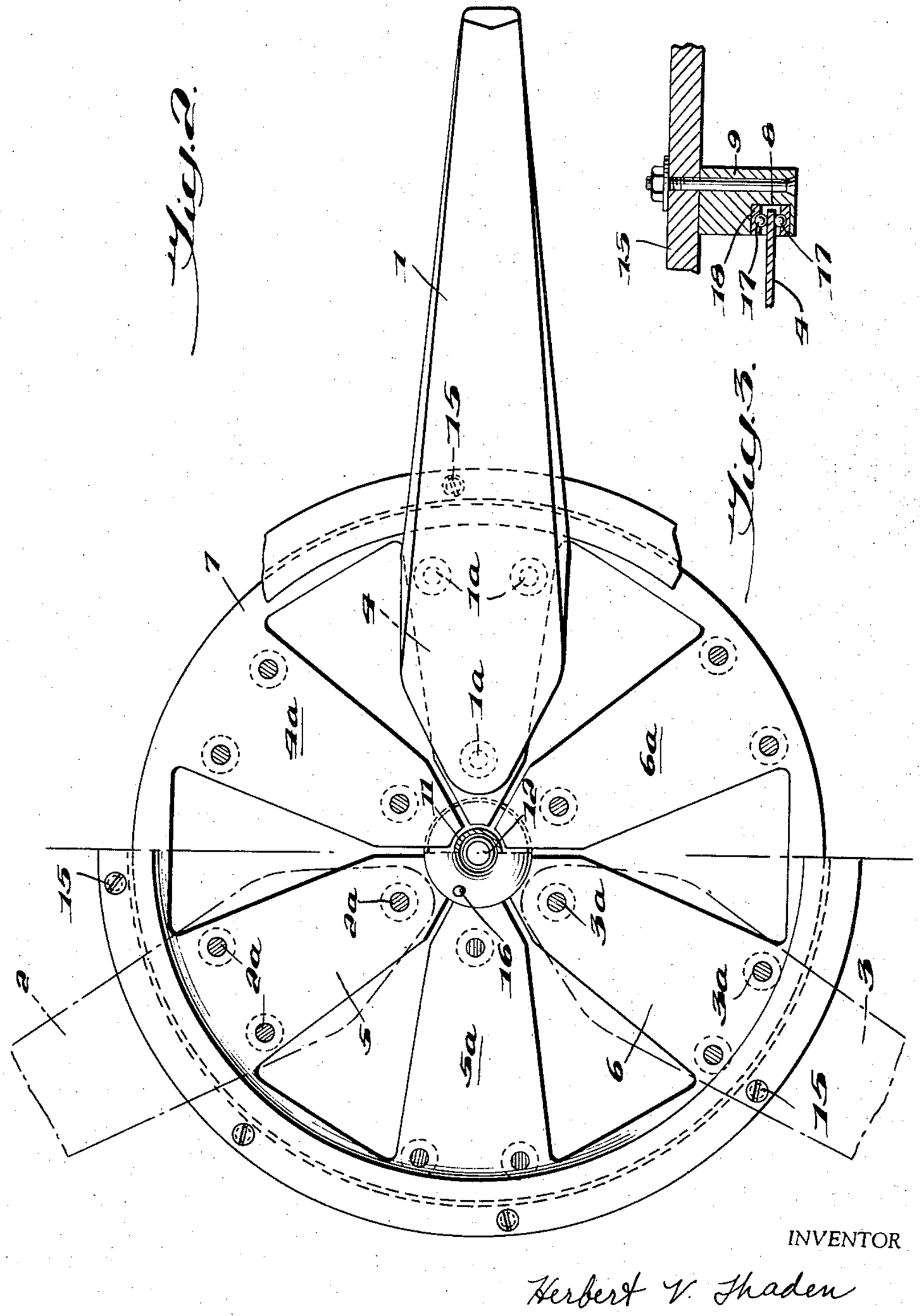

Fig. 3.

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VERTICALLY ADJUSTABLE CHAIR

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5 Claims. (Cl. 155—88)

This invention relates generally to vertically adjustable chairs, and more particularly to chairs in which the angular relationship of the legs with respect to the seat frame may be adjusted equally by rotary movement of the seat to effect vertical adjustment of the height of the seat frame.

Vertically adjustable chairs per se are well known in the patented prior art. Various types of height adjustment means for chair seats are known, as for example, the familiar piano stool screw means, rack and pinion means, plural tong linkage means, and the like. The instant invention relates to a novel chair height adjustment means in which rotational movement of the chair seat effects an angular adjustment of the legs to vary the height of the seat frame with respect to the floor support.

Thus the primary object of my invention is to provide a vertically adjustable chair in which rotary movement of the seat frame effects equal angular adjustment of the chair legs to effect a variation of the height of the seat from the floor support.

A more specific object of my invention is to provide a vertically adjustable chair provided with central screw means which, upon rotational movement of the seat, causes the chair legs to pivot radially inwardly or outwardly to raise or lower the height of the seat frame.

Still another object of my invention is to provide a vertically adjustable chair having a circular spider plate with chair legs radially secured thereto so that vertical movement of the central portion of the spider will effect angular adjustment of the legs with respect to each other with the result that the height of the chair seat will be varied accordingly.

Other objects and advantages of my invention will become more apparent from a study of the following specification when considered in conjunction with the accompanying drawings, in which:

Fig. 1 is a partially-sectioned side elevation view of my invention; and

Fig. 2 is a bottom plan view taken on line 2—2 of Fig. 1 with two of the legs being shown in phantom.

Fig. 3 is a sectional view showing in detail an improved spider-slot arrangement.

Referring now to the drawings, the chair of my invention consists of rigid supporting legs **1**, **2**, and **3** each of which is securely fastened at its upper end by suitable screw or bolt means **1***a*, **2***a* and **3***a* to projecting levers **4**, **5** and **6**, respectively of flexible spider **7**. The spider is formed from a suitable spring metal sheet by stamping, punching, cutting or any other suitable manufacturing method. The outer peripheral portion of the spider **7** is journalled in an inner circumferential groove **8** in annular bearing **9** and the inner portions of the spired levers **4**, **5**, **6**, **4***a*, **52** and **6***a* extend into groove **10** peripherally located in nut **11**. Nut **11** is threadably mounted upon an vertically movable with respect to central screw **12** rigidly secured to seat frame **13** by rivets **14**. The annular bearing **9**, which is preferably formed from a strong metal such as steel, is similarly rigidly secured to the seat frame **13** by suitable bolt means **15**. The seat cushion, which has not been illustrated in the drawing, may be secured to the base frame **13** by suitable securing means. Restraining pin **16** extends through nut **11** and spider **7** to prevent relative rotational movement between the nut and the spider.

The operation of the vertical adjustment of the seat may now be readily described.

Upon rotation of the seat base frame **13** in a given direction, nut **11** is caused to move vertically upwardly due to the cooperation of the screw threads of nut with the threads of the central screw **12**. Upward movement of the nut causes the inner ends of the spider levers located within the peripheral groove of nut **11** similarly to be drawn upwardly toward seat frame **13** but the peripheral outer portion of the spider journalled in groove **8** of the annular bearing **9**, is restrained against vertical movement with respect to the seat frame. Referring to Fig. 1, as the spider lever **4** is drawn upwardly to the position *4u*, the leg **1** secured thereto will pivot inwardly and upwardly to the position 1A. All the other legs will similarly be pivoted upwardly and inwardly and the feet of the legs will be drawn inwardly together with the result that the height of the seat frame **13** will be raised with respect to the floor support.

Similarly, upon rotation of the seat frame **13** in the opposite direction, nut **11** is caused to move downwardly upon screw **12** causing the inner edges of the spider to be urged downwardly with respect to the seat frame. Spider lever **4** will be moved downwardly to the position *4d* and leg **1** will pivot downwardly and outwardly to the position 1B. All the other legs will similarly be pivoted downwardly and outwardly with the feet moving outwardly so that the height of the seat frame **13** will be lowered with respect to the floor support. Thus it is apparent that rotation of the seat frame in either direction will angularly adjust the legs to move the feet of the legs apart or together to lower or raise the height of the seat as desired.

As shown in Fig. 3, ball bearings **17**, **17'** rotatably secured in housing **18**, **18'** may be provided on either side of the spider **4** in the groove **8** to reduce the friction between the spider and the groove walls.

While the device illustrated has been provided with three legs, it is apparent that any number of legs might be utilized depending upon the number of spider levers provided. For example, with the spider illustrated in Fig. 2, additional legs could be secured to spider levers **4***a*, **5***a* and **6***a* to provide an extremely stable six-legged chair support. In view of the uniformity of movement of the inner ends of the spider levers with respect to the groove **8** in the annular bearing **9**, the legs will accordingly move equally angularly with respect to the seat frame **13** so that all of the feet of the legs will maintain contact with the floor to provide a continuously balanced support.

While in accordance with the provisions of the statutes I have illustrated and described the best form of embodiment of my invention known to me, it will be apparent to those skilled in the art that changes may be made in the apparatus described without departing from the spirit of my invention as set forth in the appended claims.

I claim:

1. A vertically adjustable chair comprising a seat frame, a flexible spider member rotatably connected to said frame, a plurality of legs rigidly secured at their upper ends in spaced relationship to said spider member, and screw means operated by said seat frame for vertically adjusting a portion of said spider member with respect to said seat frame to cause relative radial expansion or

contraction of the lower extremities of said legs to adjust the height of said seat frame.

2. A vertically adjustable chair as defined in claim 1 wherein said screw means is centrally located with respect to said spider member.

3. A vertically adjustable chair as defined in claim 2 wherein said legs are divergent and are radially secured to said spider member with respect to said screw means.

4. A vertically adjustable chair comprising a seat frame, an annular bearing rigidly secured to said frame and having a peripheral groove on the inner circumference thereof, a circular flexible spider member rotatably journalled in the peripheral groove of said annular bearing, said spider member having an aperture centrally located therein, a screw secured to said frame and extending through the central aperture of said spider member, a nut threaded upon said screw and having a peripheral groove on the outer circumference thereof, the inner portion of said spider adjacent the central aperture extending into the groove in said nut and being secured against rotation therein, and a plurality of legs secured at their upper ends to said spider member radially of the central

aperture, said nut being caused to move vertically on said screw upon rotation of said seat frame with respect to said spider to effect vertical movement of the central portion of said spider member with respect to said frame to cause either relative radial expansion or contraction of the lower extremities of said legs to adjust the height of said seat frame.

5. A vertically adjustable chair as defined in claim 4 including ball bearing means in the peripheral groove of said annular bearing for reducing the friction which occurs between the spider surfaces and the groove walls upon rotational movement of said annular bearing with respect to said spider.

References Cited in the file of this patent

UNITED STATES PATENTS

1,827,415	Bidwell	Oct. 13, 1931
2,389,366	Jones	Nov. 20, 1945
2,673,773	Dusenbury	Mar. 30, 1954
2,759,528	Rachman et al.	Aug. 21, 1956