April 24, 1956 A. Z. BOYAJIAN 2,742,954

ADJUSTMENT FOR CHAIR-SEAT

Filed Nov. 24, 1954

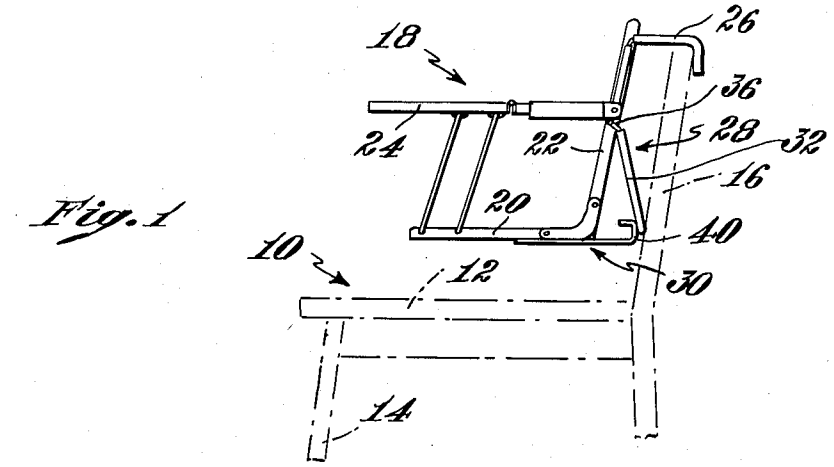


Fig. 1

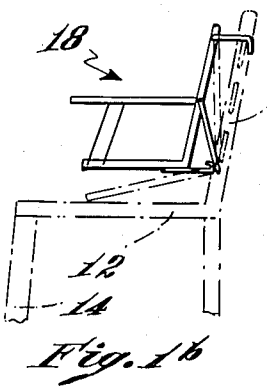


Fig. 1b

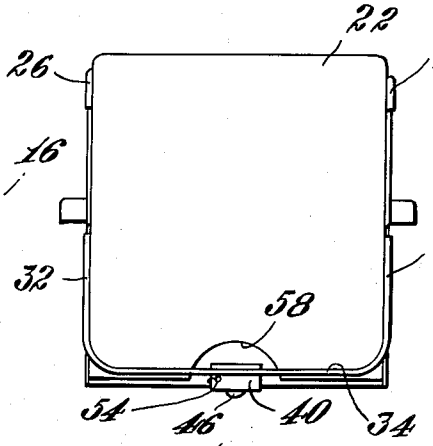


Fig. 2

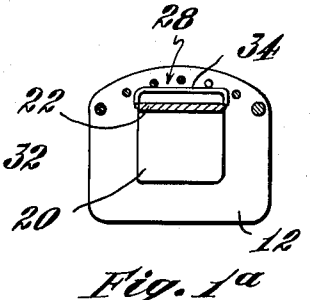


Fig. 1a

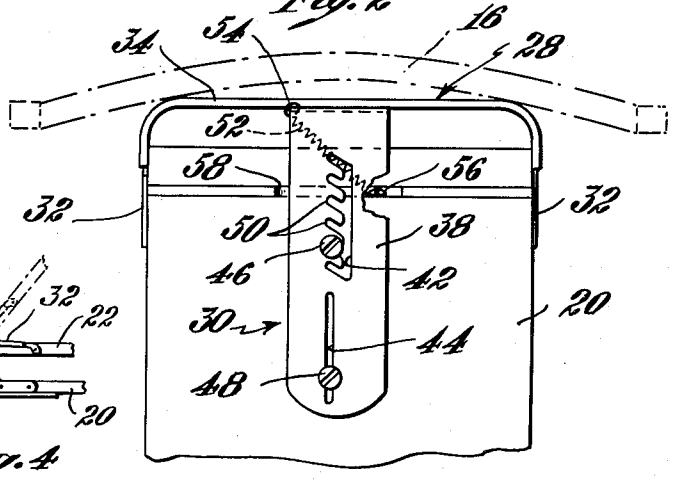


Fig. 3

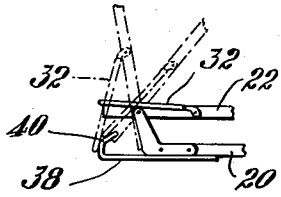


Fig. 4

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United States Patent Office 2,742,954 Patented Apr. 24, 1956

2,742,954

ADJUSTMENT FOR CHAIR-SEAT

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Application November 24, 1954, Serial No. 470,892

18 Claims. (Cl. 155—131)

This invention relates to improvements in chair-seats of the kind disclosed in my Patent No. 2,604,143, for use in conjunction with full size chairs and particularly to improved means for adjusting the seat relative to the chair back to level it.

The principal object of this invention is to provide an adjustment device for chair-seats which will be operative regardless of the inclination or shape of the back and regardless of the position or spacing of the supporting spindles or bars in the back to which it is to be applied. Another object is to provide an adjustment device which is equally useful with a fixed or foldable type of chair-seat and does not interfere with collapsing a foldable seat. Another object is to provide an adjusting device for foldable chair-seats which may be initially adjusted to a predetermined position and will automatically reset itself when the seat is unfolded for use. Another object is to provide a device which can be manipulated unseen with a minimum of effort and without adjustment of screw threaded parts, clamps, nuts and the like which are prone to become fixed and to require tools to loosen or set them. A further object is to provide a device which is quick-acting, inexpensive to manufacture, durable and may be applied to the chair-seat without spoiling its appearance. Another object is to provide an adjustment device for positioning and repositioning parts with reference to each other which, while particularly adaptable to leveling a chair-seat has utility for other purposes.

As herein illustrated the device is shown in conjunction with a chair-seat having a seat, back, tray and hooks for supporting the same from the top rail of the back of a chair. In accordance with the invention the seat is suspended from the top rail of the chair back by the aforesaid hooks and an adjustable brace is mounted on the back to hold the lower part thereof at different distances from the chair back on which it is suspended depending upon the position and availability of supporting structure below the top rail of the chair back. The brace is connected to the back of the chair-seat so that it may be swung rearwardly at an angle thereto and there is a latch plate fastened to the seat for holding the brace at a predetermined angular position with reference to the back. The brace has spaced parallel bearing elements which parallel the lateral edges of the back and a horizontal bearing element which spans the parallel bearing elements thereby providing bearing surfaces which extend downwardly toward the seat for engagement with any transversely extending bars in the chair back and a transversely extending bearing surface for engagement with any upright bars or spindles in the chair back. The latch plate is slidably mounted on the underside of the seat for forward and rearward movement and has a part at its rear end adapted to bear against the brace to hold it exetnded at the selected angular position desired. The latch carries a plurality of spaced notches distributed along a line parallel to the direction of sliding movement thereof and a pin is fixed in the seat in a position to be engaged by the notches. The notches are inclined to lock the plate in its position of adjustment. A strong spring is optionally stressed between the spaced points on the seat and the latch plate and operates on the plate to restore it to its forward position when manually disengaged from the pins and incidentally assists in holding the plate engaged with the pins at any given position of adjustment. More specifically the plate is pivotally and slidably fastened to the seat and has in it an elongate slot, along one edge of which is a plurality of notches with which the pin may selectively be engaged. The spring is optional and if used is anchored between points spaced longitudinally and diagonally of the direction of movement of the plate so that it urges the plate laterally so as to hold the notches against the pin and urges the plate forwardly when the plate is disengaged from the pin to restore it to its forward inoperative position.

The brace and latch plate are carried respectively by the back and seat which are articulated for folding and hence are movable into and out of operative position with respect to each other as the parts are folded and unfolded. In accordance with the invention the plate may be initially adjusted to a predetermined setting to hold the brace at a predetermined angle with respect to the back and when set at said predetermined position will automatically reset the brace at its desired angular position each time the back is unfolded and set upright with respect to the seat.

In a broader aspect the device provides for quick adjustment between any two parts where adjustment of one part relative to the other is desired. As such the parts are connected together for longitudinal sliding movement relative to each other and pivotal movement; one of the parts carries a fixed pin and the other a slot engaged with the pin which has along one edge spaced notches and a spring is fastened under stress at its ends to the respective parts at points spaced both longitudinally and diagonally of the direction of sliding movement between the parts.

The invention will now be described in greater detail with reference to the accompanying drawings wherein:

Fig. 1 is a side elevation of the chair-seat suspended on the back of a chair with the adjusting device partially distended;

Fig. 1*a* is a plan view of a conventional chair having a back structure wherein there are spindles arranged in a circle showing the position of the rear edge of the chair-seat;

Fig. 1*b* is a side elevation of a conventional chair having a back structure wherein there are transverse bars showing the position of the rear edge of the chair-seat in the absence of a brace and supported by a brace;

Fig. 2 is a back view of the chair-seat showing the adjusting device retracted;

Fig. 3 is a bottom view of the chair-seat showing the positioning plate partially distended; and

Fig. 4 is a side elevation of the chair-seat shown in folded, intermediate and unfolded positions.

Referring to the drawings there is shown a conventional chair **10** having a seat **12**, legs **14** and back **16** and on the back of the chair is suspended a high chair **18**. This high chair or chair-seat, as it will be called hereinafter, is of the collapsible kind disclosed in the above-identified Patent No. 2,604,143; although, it is to be understood that the invention is not confined in its application to collapsible chair-seats and consists of a bottom **20**, back **22** and a tray **24**. A pair of spaced pivoted arms **26—26** are connected to opposite sides of the back **22** near the top, preferably being made of stiff wire, and are covered with rubber tubing for suspending the chair-seat from the top of the chair back **16**. Without some means for supporting the bottom of the chair-seat at a given distance from the back of the chair the plane of the seat **20** would occupy various positions of

slant depending upon the shape and inclination of the chair back **16** and of the position of supporting structure in the chair back itself. For example, if there were vertical spindles arranged circularly in the back of the chair as shown in Fig. 1*a* the lower part of the chair-seat being narrower than the frame at the back except for the brace **28**, the seat would swing rearwardly so far before it came in contact with the spindles that the seat **20** would slope forwardly and downwardly with the result that the child would slide forward to a very uncomfortable position or possibly slide out of the chair-seat. Moreover dishes and other articles placed on the tray would slide off. Similarly if instead of vertical spindles cross bars were used in the back as shown in Fig. 1*b* the lower part of the seat might not come opposite one of the bars and hence the seat would swing rearwardly as shown in dot and dash lines so that the bottom **20** would again be inclined forwardly and downwardly. The purpose of this invention is to provide adjustable means for holding the chair-seat with its bottom **20** in a substantially horizontal position regardless of the peculiarities of the structure of the chair back and as illustrated herein this is accomplished by providing a swingable brace **28** and a latch plate **30** for holding it at such an angular position with reference to the back that the bottom of the chair-seat is level. The brace **28** consists of a U-shaped piece of stiff wire covered with a rubber tube which has spaced parallel legs **32—32** and a horizontal connecting loop **34**. The ends of the legs **32—32** are pivotally connected to the sides of the chair-seat back **22** by pins **36—36** and constitute downwardly extending, spaced parallel bearing surfaces which by suitable angular adjustment may be engaged with horizontally positioned structural members in the chair back **16**. The horizontal loop portion **34** provides a transverse bearing surface which may be engaged with vertically disposed structural members in the chair back; as for example one or more spindles set between the top of the chair back and the chair seat. As thus constructed the brace will accommodate itself to the transverse curvature of substantially any chair back regardless of the position and of the location of the vertical or horizontal supports therein.

The latch plate **30** (Figs. 1 and 3) consists of a flat metal plate **38** which has at its rear end an upwardly and rearwardly inclined lip **40** adapted to bear against the brace **28** and to hold the same at any desired angular position with reference to the back. The vertical rise of the lip **40** compensates for the radius of swing of the brace so that it remains in engagement with the lip throughout its angular movement, and also automatically cams the brace to the desired position during unfolding of the chair-seat back as it is raised to an upright position with respect to the bottom. The plate **38** is slidably fastened to the bottom of the seat **20** for linear movement forwardly and rearwardly and to this end has in it a pair of spaced slots **42** and **44** for engagement with a pair of spaced screws **46** and **48**, the latter having heads which retain the plate in place. The rearmost slot **42** has along one edge thereof a plurality of spaced notches **50** located longitudinally thereof and along a line which coincides with the center line of the slot **44** thus increasing the width of the slot **42** at each notch by approximately twice its normal width. The plate is thus not only movable longitudinally but is swingable angularly in the plane of the bottom about the screw **48** as a center when one of the notches is opposite the screw **46**. By swinging the plate **38** toward the left as shown in Fig. 3 so as to bring the screw **46** into the body of the slot **42** and then sliding it forwardly or rearwardly any one of the notches **50** may be brought into a position opposite the screw **46**. If then the plate is swung toward the right the selected notch may be engaged with the screw thus to latch the plate at that position. Preferably the notches **50** are inclined rearwardly so as to oppose disengagement of the notches from the screw by pressure tending to collapse the brace as will normally be exerted during use of the chair-seat by the weight of the occupant which tends to swing the chair-seat rearwardly. The inclination of the notches found best for holding the parts securely locked without danger of disengagement and yet without making it difficult to disengage the parts when it is desired to adjust the same was found to be $30° \pm 15°$. Optionally a coiled spring **52** is anchored to the lip **40** at **54** and is stretched diagonally across the center line of the plate and attached at its opposite end by a screw **56** to the rear edge of the seat. The spring provides means for returning the plate to its inoperative position when it is desired to collapse the brace and also tends to urge the plate forwardly and laterally so as to keep the screw **46** in the notch with which it is engaged.

The brace which has heretofore been described as U-shaped is so dimensioned that when it is collapsed against the back of the chair-seat it will lie substantially in the plane of the back and will not interfere with folding the seat. In order that the positioning plate may likewise be collapsed to an out-of-the-way position the lower part of the back **22** is cut away to provide a lenticular opening **58** (Fig. 2) into which the lip **40** may be drawn.

As will be seen by reference to Fig. 4 the lip **40** at the end of the positioning plate lies in the path of the lower end of the brace as the back is lifted to an upright position so that during raising of the back the brace is caught on the lip, cammed outwardly and held thereby during final movement of the back to its upright position. Thus if the positioning plate is preset for holding the brace at a predetermined angular position with respect to the back and is left in this position it will automatically reset the brace at the aforesaid position each time the parts are unfolded after having been folded for storing without having to re-adjust the positioning plate itself.

In using the chair-seat the hooks **26—26** are first placed over the top of the chair and then the lip **40** of the plate **30** is grasped and pulled rearwardly against the spring tension so as to push the brace **28** rearwardly at an angle to the back of the seat until the brace bears against some structural member in the chair back **16** which holds the chair-seat with its seat **20** in a horizontal position. When the lip is released the plate will automatically take up its adjusted position by engagement of the nearest slot therein with the screw **46**. To release the plate it is merely necessary to swing it to the left as shown in Fig. 3 to disengage the slot from the screw whereupon it will be drawn forwardly to its collapsed position with the lip housed within the opening **58**.

As previously indicated the latch plate may be set at the desired position and fixed at this position and thereafter the chair-seat may be folded for storage and reset up for use without disturbing the plate which will automatically engage the brace as the back is folded to an upright position to move it to the desired angular position with reference to the back. Thus once the proper setting is found it is not necessary to change this setting until a different type of adult chair is used from which to suspend it.

It is evident as discussed above that the device may be used equally as well with non-collapsible chair-seats as with collapsible chair-seats. Furthermore, it is contemplated that the latch plate may be used for other purposes where quick, sure and accurate adjustment of two parts relative to each other is desired, and it is contemplated that the invention covers this broader application of the device as well as its application to chair-seats.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. A high chair comprising a seat, a back and a tray, a pair of hooks connected to the back for suspending the high chair from the back of a conventional chair, a brace swingably mounted on the back for movement from the plane of the back rearwardly at an angle thereto, and a latch member mounted on the seat with a part projecting rearwardly for contact with the brace, said latch member being rearwardly movable to increase the angle between the back of the seat and the brace, a plurality of spaced notches carried by the latch member arranged parallel to the direction of movement thereof, a pin fixed to the seat selectively engageable with the notches in the latch member by movement thereof relative to the pin, and a spring operating on the latch member in a direction yieldably to hold the selected one of the notches engaged with the pin.

2. A high chair comprising a seat, a back and a tray, a pair of hooks connected to the back for suspending the high chair from the back of a conventional chair, a brace swingably mounted on the back for movement from the plane of the back rearwardly at an angle thereto, and a latch plate mounted on the seat with an end projecting rearwardly for contact with the brace, said plate being rearwardly slidable to swing the brace angularly away from the back, and angularly swingable with respect to one end in the plane of the seat, a plurality of spaced notches carried by the latch plate which are arranged parallel to the direction of slidable movement thereof, a pin fixed to the seat, said latch plate being slidably movable with reference to the pin to bring any one of the notches opposite the pin, and angularly swingable to engage a given notch with the pin opposite it, and a spring operating on the latch plate in a direction to hold the selected notched portion of the plate engaged with the pin.

3. A high chair comprising a seat, a back and a tray, a pair of hooks connected to the back for suspending the high chair from the back of a conventional chair, a brace swingably mounted on the back for movement from the plane of the back rearwardly at an angle thereto, and a latch plate mounted on the seat with a part projecting rearwardly for contact with the brace, said latch plate being longitudinally slidable forwardly and rearwardly to change the angular position of the brace with respect to the back, and angularly swingable with respect to its forward end and in the plane of the seat, a plurality of rearwardly inclined notches carried by the latch plate, said notches being arranged parallel to the direction of longitudinal movement of the latch plate, a pin fixed to the seat in a position to be engaged by one of the notches and disengageable therefrom by swinging the notch carrying portions of the plate away from the pin and a stressed spring connected between spaced points on the latch plate and seat which opposes both longitudinal and angular movement of the plate.

4. A high chair comprising a seat, a back and a tray, a pair of hooks connected to the back for suspending the high chair from the back of a conventional chair, a brace swingably mounted on the back for movement from the plane of the back rearwardly at an angle thereto, and a latch plate having tandemly arranged, longitudinally extending, elongate slots therein, a pair of spaced pins fast to the seat, said pins being engaged with the respective slots and slidably supporting the latch plate on the seat for longitudinal movement forwardly and rearwardly to change the angular position of the brace with respect to the back, the rearwardly located one of the slots having a plurality of notches along one longitudinal edge which coincide with the longitudinal center line of the forward slot, with which the pin may selectively be engaged, said pin being disengageable from a given notch by swinging the plate angularly with respect to the pin in the forward slot to bring the pin in the rear slot into contact with the opposite edge of its slot clear of the notches and a strong coiled spring connected to the plate and bottom of the seat at longitudinally spaced points, the rear end of the spring being anchored to the plate at the notched side of the slot and the forward end to the seat at the unnotched side of the slot.

5. An adjustment device comprising members pivotally and linearly slidable relative to each other, a pin fixed in one part, the other part having a plurality of spaced notches for engagement with the pin and a spring stressed between spaced points on the parts along the path of linear sliding movement thereof and diagonally across said path.

6. A high chair according to claim 1, wherein the latch plate has an upwardly and forwardly turned lip constituting an abutment for holding the brace at a selected position of angular adjustment relative to the back.

7. A high chair according to claim 1, wherein the latch plate has a lip extending upwardly and forwardly which constitutes an abutment for the brace and the back has at its lower part an opening in which the lip may be seated when the latch plate is retracted.

8. A high chair according to claim 1, wherein the brace has spaced parallel bearing surfaces paralleling the edges of the back and a horizontal bearing surface extending transversely of the back.

9. A high chair according to claim 1, wherein the brace is U-shaped and is pivotally suspended at the ends of its legs with the loop depending for engagement with the rearwardly projecting end of the latch plate.

10. A high chair according to claim 1, wherein the brace is U-shaped and pivotally suspended at its ends from the opposite sides of the back with the loop depending and substantially level with the seat when in contact with the back.

11. A high chair according to claim 1, wherein the brace is U-shaped and is pivotally suspended at its ends from the opposite sides of the back substantially vertically subjacent to the supporting hooks with its loop depending and substantially level with the seat when it is in contact with the back.

12. A foldable high chair having a collapsible seat, back and tray, a brace swingably attached to the back for swinging movement about a horizontal axis extending transversely of the back and having depending spaced parallel bearing surfaces and a horizontally, transversely extending bearing surface, said brace being swingable substantially into the plane of the back when the seat is collapsed, a latch plate fastened to the underside of the seat for forward and rearward sliding movement therein and angular movement in the plane of the bottom relative to its forward end, said plate having a rear end portion adapted to engage the brace and to hold the same at a selected angular position away from the back, a pin fixed in the seat, a plurality of notches in the plate which may selectively be brought opposite the pin by sliding movement of the plate and engaged therewith by angular movement thereof and a spring stretched between fixed points on the plate and seat opposing both sliding and angular movement of the plate.

13. A high chair comprising a seat, a back and a tray, means for suspending the high chair from the back of a chair, a brace swingably mounted on the back for movement from the plane of the back rearwardly at an angle thereto, a positioning member movably mounted on the seat for movement rearwardly thereof, the rear extremity of the positioning member being operably associated with the brace throughout the extent of its rearward movement to effect rearward movement of the brace and to hold it at a selected angular position with respect to the back, and means for fixing the member relative to the seat to hold the brace at said selected position.

14. A high chair comprising a seat, a back and a tray, means for suspending the high chair from the back of a chair, a brace swingably mounted on the back for movement from the plane of the back rearwardly at an angular position thereto, a positioning member movably mounted on the seat for movement rearwardly thereof, the rear

extremity of the positioning member constituting a cam surface operably associated with the brace throughout rearward movement of the member to effect rearward movement of the brace and to hold it at a selected angular position with respect to the back and means for fixing the positioning member relative to the seat to hold the brace at said selected position.

15. A high chair comprising a seat, a back and a tray, articulate means connecting the parts for movement from open position for use to a folded position for storage, means for suporting the seat when open from the back of a chair, a brace mounted on the back of the high chair and movable rearwardly therefrom for engagement with the back of the chair to hold the high chair back at a predetermined spacing from the back of the chair, a positioning plate operably associated with the brace to fix it in a selected position, said positioning plate and brace being so associated that when the positioning plate is set in a predetermined position it automatically sets the brace at the desired position when the parts are unfolded.

16. A high chair comprising a seat, a back and a tray, articulate means connecting the parts for movement from an open position for use to a folded position for storage, means for supporting the seat when open from the back of a chair, a brace swingably mounted on the back for movement from the plane of the back rearwardly, a positioning plate mounted on the seat for movement rearwardly in a plane which intersects the path of movement of the brace and effects movement of the brace to an angular position when displaced rearwardly, means for fixing the positioning plate at a given position to set the brace at a predetermined angular position and a cam carried by the plate operable when the parts are unfolded automatically to swing the brace outwardly to said predetermined position.

17. A high chair comprising a seat, a back and a tray, articulate means connecting the parts for movement from an open position for use to a folded position for storage, means for supporting the seat when open from the back

of a chair, a brace swingably mounted on the back for movement from the plane of the back rearwardly, a positioning plate mounted on the seat for movement rearwardly thereof, said brace and plate lying substantially in the planes of the back and seat respectively when they are folded, said brace being swingable with the back from the folded position thereof to an upright position with respect to the seat, and a cam carried by the positioning plate which lies in the path of movement of the free end of the brace during swinging movement of the back from its folded to its upright position.

18. A high chair comprising a seat, a back and a tray, articulate means connecting the parts for movement from an open position for use to a closed position for storage, means for supporting the seat when open from the back of a chair, a brace swingably mounted on the back for movement from the plane of the back rearwardly, said brace normally lying substantially in the plane of the back when the latter is folded against the seat, a positioning plate mounted on the seat having a portion of it arranged to lie in the path of movement of the free end of the brace as the back is lifted to an upright position with respect to the seat, said positioning plate being selectively positionable to intercede the free end of the brace and hold it at a predetermined angular position with respect to the back as the latter is moved into upright position.

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