June 23, 1959 J. J. MOLINS 2,891,602

CHAIRS

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Fig. 1.

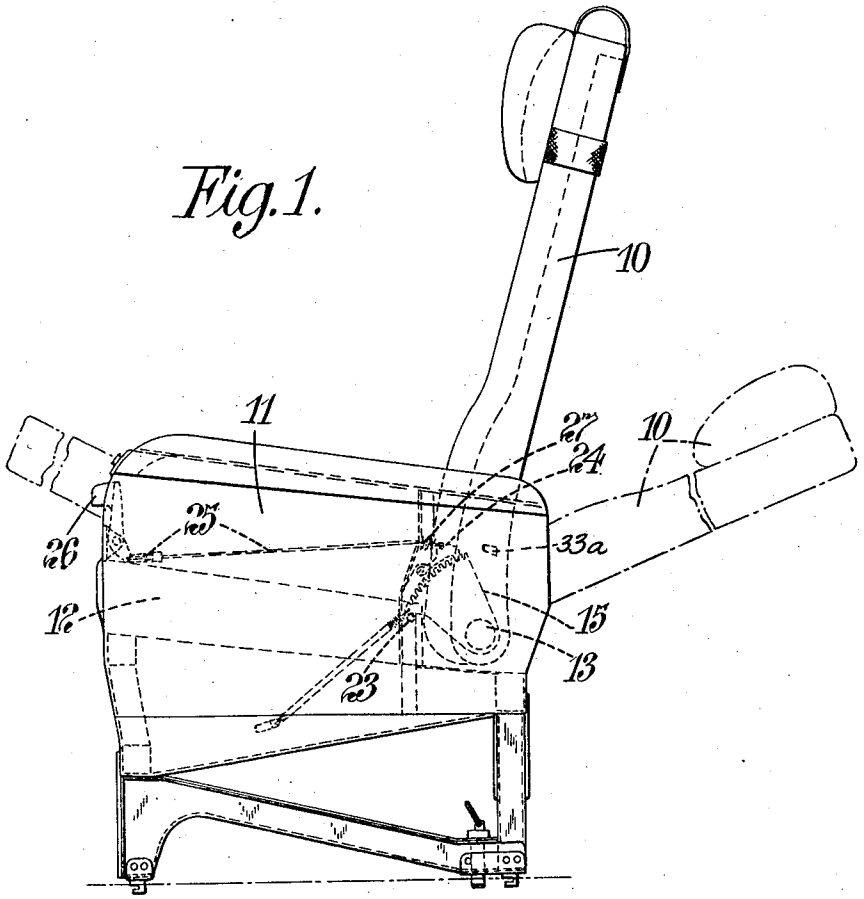
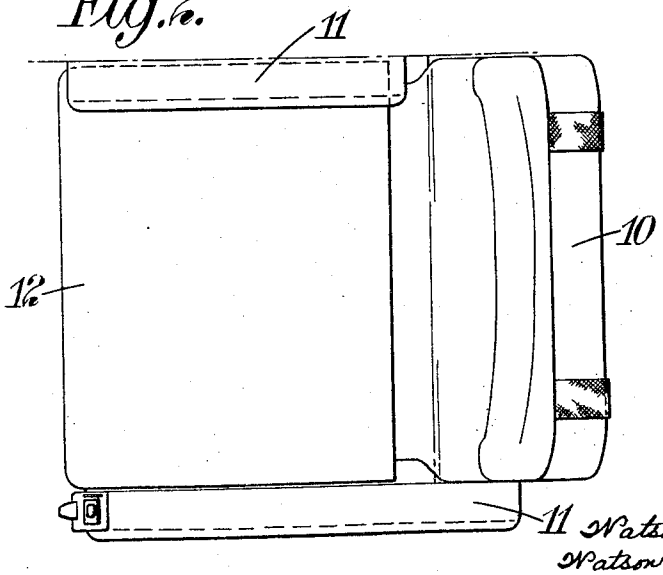


Fig. 2.



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Fig.3.

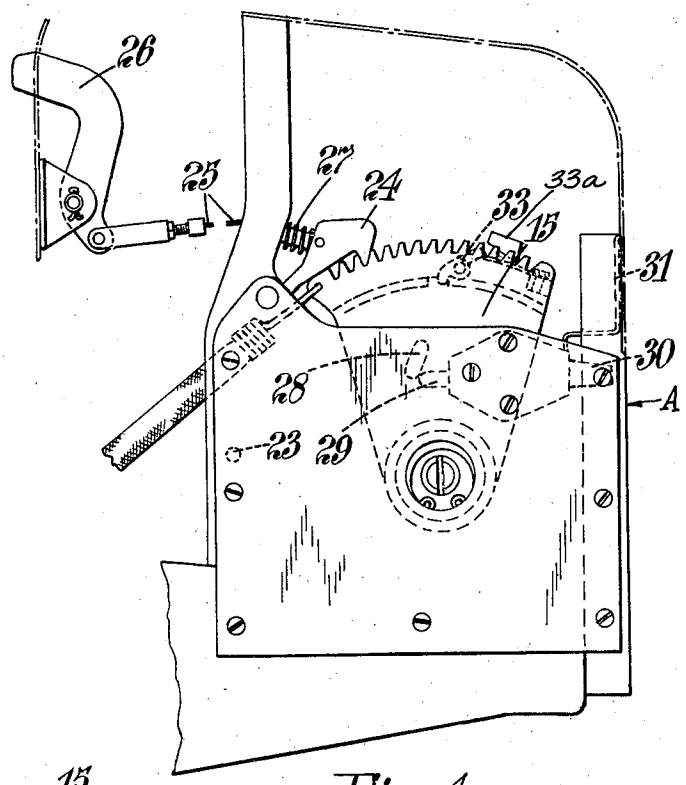
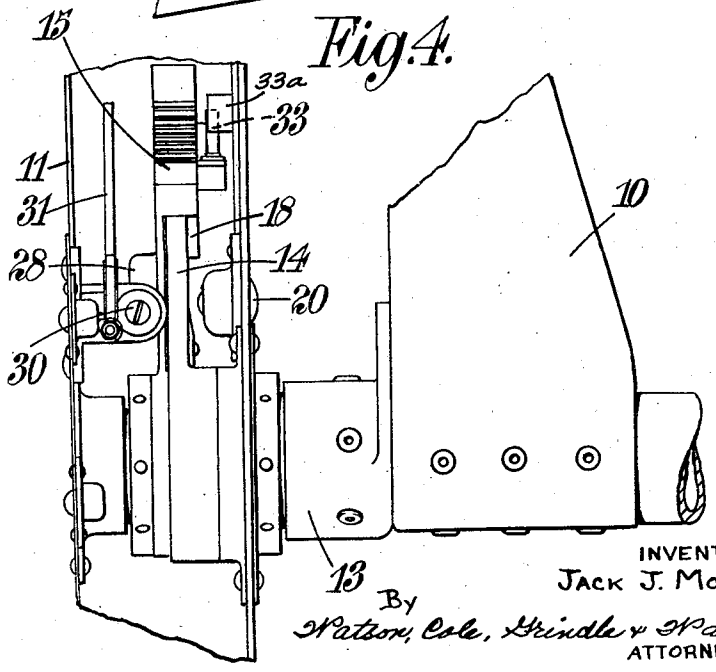


Fig.4.



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Fig.5.

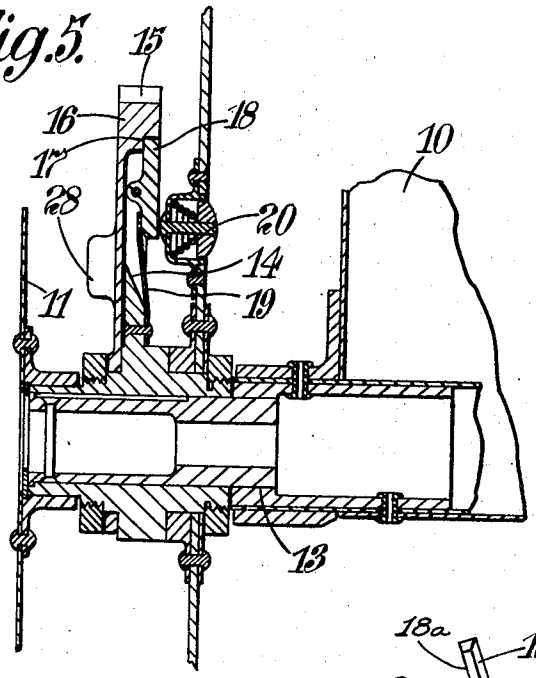


Fig.6.

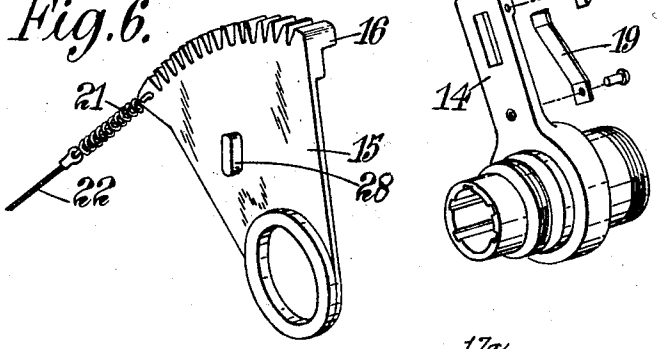


Fig.7.

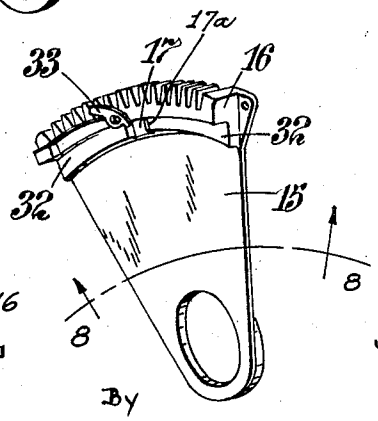
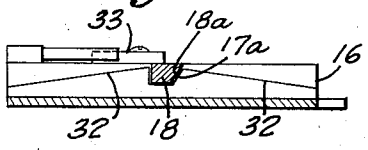


Fig.8.



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2,891,602

CHAIRS

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Application August 22, 1956, Serial No. 605,634

Claims priority, application Great Britain August 23, 1955

12 Claims. (Cl. 155—160)

This invention is concerned with chairs and in particular with chairs having backs of which the angle to the vertical can be adjusted.

It is an object of the invention to provide simply operated and reliable means for adjusting the back of a chair.

According to the invention a chair having a back mounted to swing about a horizontal axis is provided with a toothed member and with a pawl member, one member being secured to a fixed part of the chair and the other being arranged to swing with the back, the pawl member being engageable with the teeth of the toothed member to hold the back at the required inclination and release means being provided operable to disconnect one of said members from the fixed part of the chair or from the back whereby the back can be swung freely.

Preferably the toothed member is connected with the back and said release means is adapted to disconnect the toothed member from the back.

Conveniently spring or like means may be provided biassing the toothed member in a direction such as to move the back into an upright position.

In a preferred construction the toothed member comprises a pivotally-mounted quadrant and the release means comprises an arm fixed to swing with the back and provided with an abutment piece movable thereon and spring-urged into driving engagement with a recess in the quadrant, manually-operable means being provided for moving the abutment piece out of the recess. In addition stop means may be provided for limiting rearward movement of the quadrant, said stop means being adjustable. Thereby the back can be adjusted by a manually operable control for the pawl member to any of a number of positions between an upright position and a rearward position determined by the stop means. Further rearward movement (e.g. to position the back horizontally) can then be effected by actuating the release means. The pawl member and the teeth of the toothed member may be so formed that when the back is pushed forwardly the teeth slide underneath the pawl member.

The following is a description, by way of example, of a chair embodying the above and other features of the invention, which chair is intended particularly for use in passenger aircraft.

Reference is made in the following description to the accompanying drawings, in which:

Figure 1 is a side view of the chair with its back inclined at 16° to the vertical;

Figure 2 is a plan view of the chair with its back in the position of Figure 1;

Figure 3 is a side view of control mechanism for the chair back in the position when the back is inclined at 60° to the vertical;

Figure 4 is a view of the control mechanism in the direction of the arrow A in Figure 3;

Figure 5 is a vertical section through the control mechanism viewed in the direction of arrow A;

Figure 6 is an exploded view of the control mechanism;

Figure 7 is a reverse view of part of the quadrant member shown in Figure 6; and

Figure 8 is a sectional view of the quadrant in the direction of the arrows 8—8 of Figure 7 and showing the detent in position.

The chair comprises a back 10, hollow sides or arms 11 and a seat 12. The chair back 10 carries at its bottom a horizontal hollow shaft 13 journalled at each end in the hollow sides 11 of the chair. Within one side 11 of the chair a radial arm 14 (see Figures 5 and 6) is fixed to the shaft 13 and a toothed quadrant 15 is rotatably mounted on the shaft. The arcuate toothed periphery of the quadrant 15 is thickened at 16 and contains a central recess 17 in which engages a detent 18 pivotally mounted on said radial arm 14. A spring 19 on the arm 14 holds the detent 18 in engagement with the recess 17 and a spring-return press-button 20 (accessible on the outside of the arm on the surface adjacent the seat) is mounted on the chair arm, which button 20 is engageable, when manually depressed, with the detent 18 to move it against its spring 19 out of the recess 17. Thus normally the quadrant 15 is connected to the shaft 13 and swings with the chair back 10. The quadrant 15 has connected thereto spring or like means (in the drawings a spring 21 and rubber cord 22 are used) biasing it into a position in which the chair back 10 is upright. Preferably the quadrant 15 is arranged to engage stop means 23 when the chair back is in a predetermined upright position (e.g. inclined back at 16° to the vertical as shown in Figures 1 and 2). In this case said recess 17 in the quadrant 15 and the detent 18 are provided with cam faces 17*a*, 18*a*, respectively, such that when the chair back is grasped and pushed forwards past the 16° position, said detent 18 moves out of the recess 17, thus permitting forward movement of the chair back 10 although the quadrant 15 remains stationary. That is particularly useful in emergencies.

A pawl member 24 is pivoted inside the side of the chair and is engageable with the teeth of the quadrant 15 so as to lock the quadrant against rearward movement. The pawl member is connected by a cable 25 with an operating lever 26 accessible from outside the chair arm so that when the lever 26 is actuated the pawl 24 clears the teeth of the quadrant 15 thus permitting the chair back 10 to be swung backwards to a desired position whereupon the operating lever 26 is released and the pawl member 24 engages and locks the quadrant again under the action of a return spring 27. Thus the number of teeth on the quadrant 15 may be such as to provide 4° adjustments from said 16° position to a 68° position (i.e. over 52°). When the operating lever 26 is actuated to disengage the pawl number 24 and the chair back 10 is free from pressure, the chair back will automatically return to its upright (16°) position under the action of the spring or like means 21, 22 on the quadrant 15. The pawl member 24 and teeth are such that without actuation of the operating lever 26, if the chair back is pushed forwards the teeth will slide underneath the pawl member until rotation of the quadrant is stopped by the stop means 23.

The quadrant is provided with a lug 28 engageable with a back stop 29. The back stop 29 is adjustable so that the rearward position to which the chair back can be adjusted with the use of the operating lever 26 can be predetermined at a required position up to 68°. The back stop 29 is adjusted by a member 30 having a screw slot accessible through a hole in the back of the chair arm, so that the use of a screw-driver is necessary for adjustment. Conveniently an indicating arm 31 shows the extent of the adjustment.

A ramp 32 (see Figure 7) is provided on the quadrant 15 both forward and aft of the recess 17 so that the detent 18 automatically re-engages itself in the recess when the back is moved to the upright position from a position forward of the 16° position or from a position rearwards of 68°. A pivoted lock 33 is provided on the quadrant 15 preventing disengagement of the abutment piece 18 from the recess except when the lock is automatically hinged out of the way by engagement with a fixed abutment 33*a* secured on the fixed part of the chair when the quadrant is brought to the upright position.

The chair described above is thus capable of a number of adjustments to its back, which renders it particularly useful as a passenger seat for aircraft. The operating lever 26 can be actuated and the chair back 10 pushed backwards by 4° stages from the 16° position to the 68° position (or to a less steeply inclined position depending on the setting of the back stop 29). Actuation in this range of the operating lever 26 when there is no pressure on the chair back causes the back to move under spring action on the quadrant into the 16° position. Operation of the press-button when the back is at 16° frees the back from the quadrant so that the back can be swung into a horizontal position, suitable supports being provided for the back in this position. When in the 16° to 68° (or other selected angle) range, the back can be pushed forwardly to a desired inclination without actuating the press-button or operating lever. If necessary the back can be pushed forward beyond the 16° position. Owing to the shaping of the cam faces of the abutment member and recess in the quadrant a greater pressure is needed for movement beyond 16° than up to 16°.

I claim:

1. A chair comprising a fixed part, a back mounted to swing about a horizontal axis, a coupling having two parts engageable in a number of different angular positions about said axis, means for connecting one part of the coupling to the back, means for connecting the other part of the coupling to said fixed part, one of which connecting means comprises a disconnectible clutch, means for operating said coupling and means for operating the clutch.

2. A chair comprising a fixed part, a back mounted to swing about a horizontal axis, a coupling having two parts engageable with one another in a number of angular positions about said axis whereof one coupling part is connected to the fixed chair part and the other coupling part is connected to the back, a pair of stops arranged for contact with one another at a limiting angular position of the coupling, means for connecting one of the stops to one of the chair parts, means for connecting the other stop to the other chair part including means under the control of the operator for conditioning said other stop so as to render the stop ineffective, and means for operating the coupling.

3. A chair comprising a fixed part, a back mounted to swing about a horizontal axis, a coupling having two parts engageable with one another in a number of angular positions about said axis, whereof one coupling part is connected to the fixed chair part and the other coupling part is connected to the back, a stop on one of the chair parts, an abutment, a releasable clutch for clutching said abutment to the other chair part, which abutment is arranged, when so clutched, to engage said stop at a limiting angular position of the coupling, means for operating the coupling and means for operating the clutch.

4. A chair having a fixed part, and a back mounted to swing about a horizontal axis, which chair is provided with a control mechanism for said back comprising a toothed member and a detent member, means for connecting one member to the fixed part and means for connecting the other member to swing with the back, one of which connecting means includes clutch means adapted to clutch the respective member to its associated chair part, the detent member being engageable with the teeth of the toothed member to hold the back at a required inclination within a predetermined range of angular movement, and the clutch means being releasable to disconnect said respective member from its associated chair part whereby the back can be swung beyond said range of angular movement.

5. A chair having a fixed part, and a back mounted to swing about a horizontal axis, which chair is provided with a control mechanism for said back comprising a toothed member and a detent member, means for connecting one member to the fixed part and means for connecting the other member to swing with the back, one of which connecting means includes clutch means adapted to clutch the respective member to its associated chair part, stop means engaging the toothed member to limit the angular movement of the toothed member to a predetermined range, the detent member being engageable with the teeth of the toothed member to hold the back at a required inclination within said predetermined range, and the clutch means being releasable to disconnect said respective member from its associated chair part whereby the back can be swung beyond said range of angular movement.

6. A chair having a fixed part, and a back mounted to swing about a horizontal axis, which chair is provided with a control mechanism for said back comprising a toothed member, clutch means connected to clutch the toothed member to the back to swing therewith, a detent member secured to the fixed part and engageable with the teeth of the toothed member to hold the back at a required inclination, a stop secured to the fixed part of the chair, an abutment on said toothed member arranged to engage said stop at a limiting angular position of the toothed member, and means for releasing said clutch to disconnect said toothed member from the back whereby the back can be swung beyond said limiting angular position.

7. A chair having a fixed part, and a back mounted to swing about a horizontal axis, a toothed quadrant mounted to swing about said axis; clutch means to clutch said quadrant to the back comprising an arm fixed to swing with the back, a detent connected to said arm, a recessed portion on said quadrant, spring means urging the detent into register with the recess, and manually operable means for moving the detent out of the recess; a second detent member secured to the fixed part of the chair and engageable with the teeth of the quadrant to hold the back at a required inclination, a stop secured to the fixed part and an abutment on the quadrant arranged to engage said stop at a limiting angular position of the quadrant.

8. A chair as claimed in claim 7, comprising a further stop on the fixed part of the chair for limiting forward movement of the quadrant, the first said detent and recess being provided with cooperating cam faces so arranged that a forward pressure applied to the chair back when the quadrant is prevented from moving by said stop will cause the first said detent to ride out of the recess, thereby permitting forward movement of the chair back.

9. A chair as claimed in claim 7, comprising a lock member which is pivoted to the quadrant and is so arranged as to prevent movement of said detent out of said recess, and which lock member is engageable with a fixed abutment adapted to move the lock member into a position freeing the abutment piece when the chair back is moved into a predetermined upright position.

10. A chair as claimed in claim 7 in which a manually-operable control is provided for said second detent member.

11. A chair as claimed in claim 7 in which said second detent member and the teeth of the quadrant are so formed that when the back is pushed forwardly the teeth slide underneath said second detent.

12. A chair having a back mounted to swing about

a horizontal axis, which chair is provided with control mechanism comprising a toothed member and a pawl member, the toothed member being connected with the back and the pawl member being secured to a fixed part of the chair and the pawl member being engageable with the teeth of the toothed member to hold the back at the required inclination, and release means operable to disconnect the toothed member from the back whereby the back can be swung freely, said toothed member comprising a pivotally-mounted quadrant, said release means comprising an arm fixed to swing with the back and provided with an abutment piece movable thereon and spring biased into driving engagement with a recess in the quadrant, manually-operable means being provided for moving the abutment piece out of the recess.

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