Feb. 12, 1952 H. H. EICHORST 2,585,447

ADJUSTABLE BACK REST

Filed March 30, 1951 2 SHEETS—SHEET 1

Fig. 1

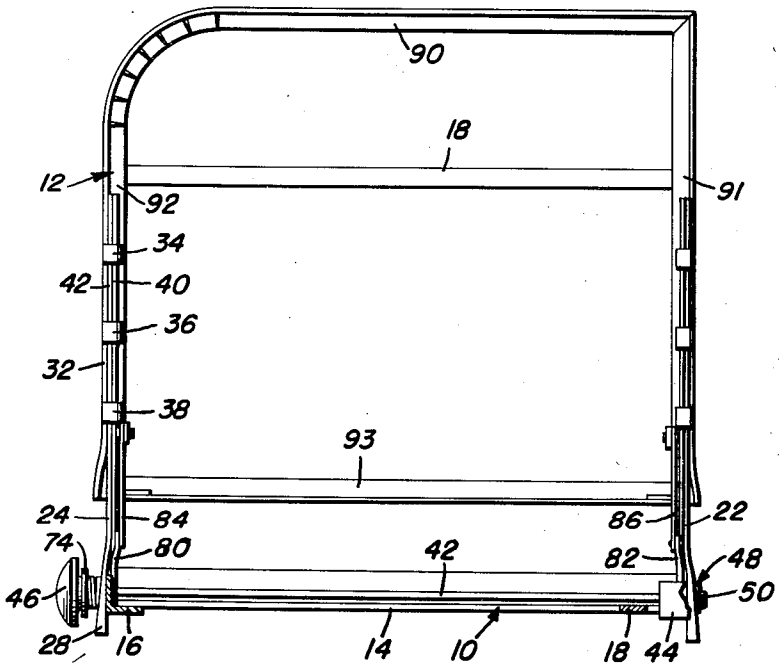


Fig. 2

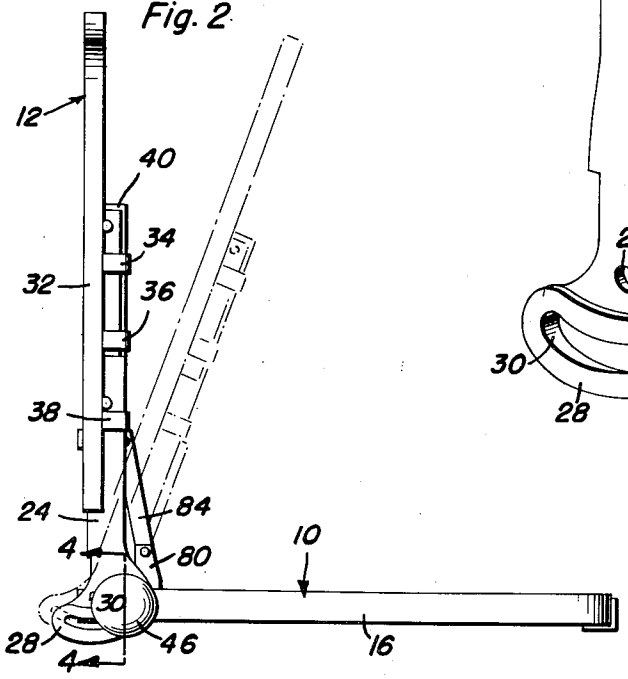
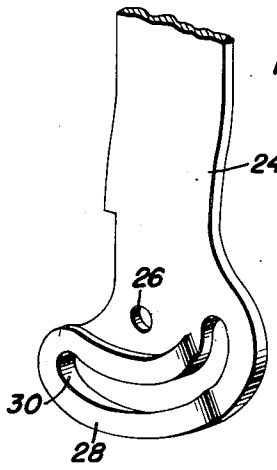


Fig. 9



Herman H. Eichorst
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

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Fig.3

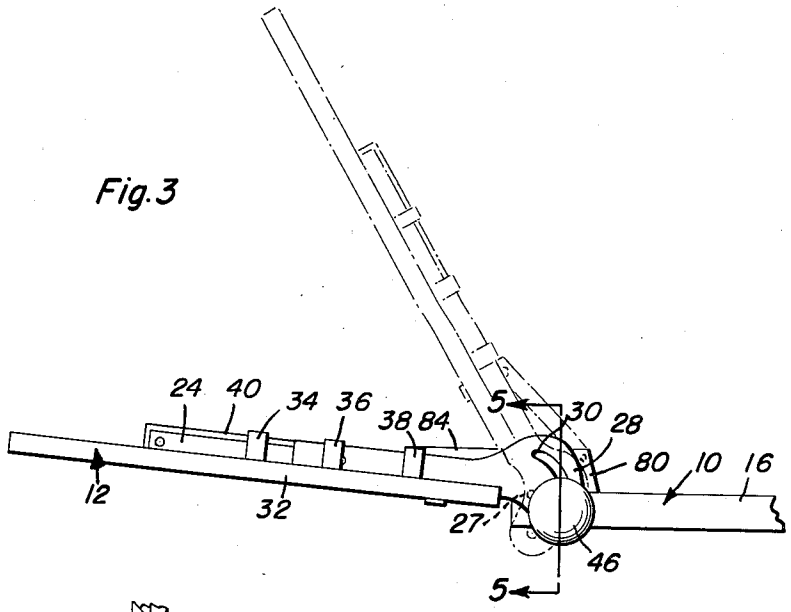


Fig.4

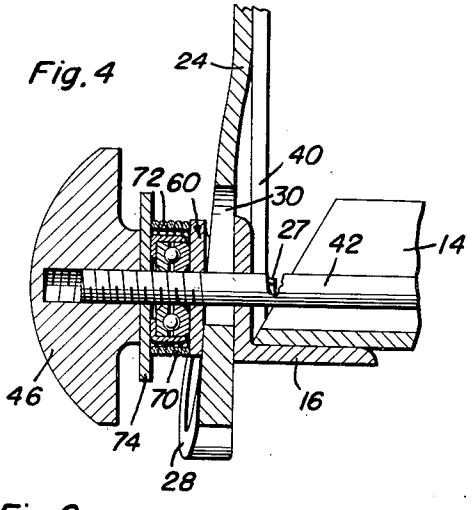


Fig. 5

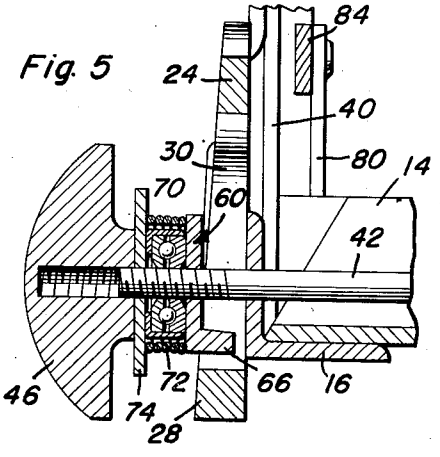


Fig.6

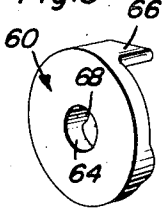


Fig.7

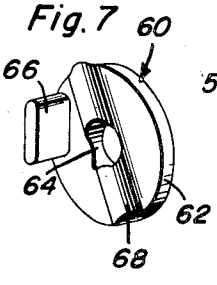
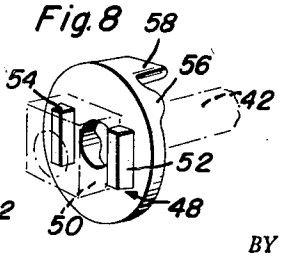


Fig.8



Herman H. Eichorst
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

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ADJUSTABLE BACK REST

Herman H. Eichorst, Hollydale, Calif.

Application March 30, 1951, Serial No. 218,401

9 Claims. (Cl. 155—152)

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This invention relates to improvements in an automotive vehicle seat.

An object of this invention is to provide an improved mechanical assembly which is operatively connected with the seat frame and back-rest frame of a seat in order to hold the back-rest frame in selected pivoted position with respect to the seat frame, said assembly including a locking rod provided with spaced locking members, one locking member being in firm contact or engagement with the cam at the lower end of one arm and the other locking member being in firm contact or engagement with the cam at the lower end of a second locking arm, both of said locking arms being pivoted to the seat frame and slidably connected to the back-rest frame, whereby when said locking members are pressed tightly against the cams, the arms will be held releasably fastened in a definite position, which position is reflected directly in an adjustment of the back-rest frame.

A further object of this invention is to provide an improved and simplified means for holding the back-rest frame in a great variety of positions depending upon the perogative of the user of the device, the adjustment being capable of a variation so that the back-rest frame is retained parallel to the seat frame or in such position that the dihedral angle between the frames is less than ninety degrees.

Ancillary objects and features of importance will become apparent in following the description of the illustrated form of the invention.

In the drawings:

Figure 1 is a vertical sectional view of the combination seat and back-rest frames showing the frames in one position;

Figure 2 is a side view of the structure of Figure 1;

Figure 3 is a side view of the structure of Figuse 1, two positions of adjustment of the back-rest frame with respect to the seat frame being illustrated;

Figure 4 is an enlarged sectional view taken substantially on the line 4—4 of Figure 2;

Figure 5 is an enlarged sectional view taken substantially on the line 5—5 of Figure 3;

Figure 6 is a perspective view of one of the locking members;

Figure 7 is a perspective view of the same locking member showing the opposite side thereof;

Figure 8 is a perspective view of another of the locking members showing in phantom its connection with the locking rod; and

Figure 9 is a fragmentary perspective view of

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one of the arms constituting a part of the assembly.

In the accompanying drawings I have illustrated a seat frame 10 together with a back-rest frame 12. The seat frame includes various angle members, the angle member 14 constituting the back of the seat frame and the angle member 16 constituting one side of the seat frame. The seat frame includes braces 18, as does the back-rest frame 12.

There is an improved assembly for pivotally connecting the back-rest frame 12 to the seat frame 10 and also for holding the back-rest frame in selected pivoted positions with respect to the seat frame. This improved assembly includes a pair of identical arms 22 and 24, the arms 24 having an opening 26 near the lower end thereof which receives a pivot pin 27, this pivot pin being carried by a part of the seat frame 10. The lower end of the arm 24 has a wedge-shaped cam 28 with an arcuate slot 30 provided in it. The slot is sufficiently long to not only extend almost entirely throughout the length of the wedge-shaped cam 28 but also to extend a considerable distance into the flat material of the lower end of the arm 24.

The arm 24 rests against the inside surface of one flat side 32 of the back-rest frame 12, said flat side constituting a part of a guide for the arm 24, the remainder of the guide being formed by the series of U-shaped brackets 34, 36 and 38 which are fixed to the back-rest frame 12 side 32. Inasmuch as the arm 24 is adapted to slide in the guideway formed by the side 32 and the brackets 34, 36 and 38, when the back-rest frame 12 is pivotally operated with respect to the seat frame 10, the brace arm 40 which is pivoted at its lower end to the pivot pin 27 and which is riveted or otherwise rigidly fixed to the arm 24, moves with it. The brace arm is located in the guideway and for facility of operation an appropriate lubricant may be used in the guideway.

A locking rod 42 extends transversely across the rear end of the seat frame 12, passing through suitable aligned openings in the side 16 of the seat frame 10 and in a bracket 44 which is carried by a part of the seat frame 10. This locking rod has a threaded outer end on which a threaded knob 46 is disposed. The opposite end of the locking rod is fixed to a locking member 48 by means of a flat sided element 50 which is fixed to said other end of said rod 42 and disposed between the ears 52 and 54 which rise from one surface of the locking element 48. The locking rod 42 is so arranged that it passes

through the slots 30 of each arm 22 and 24 and the locking member 48 is adapted to engage the cam of the arm 22 in order to hold the arm in a selected position whereby the seat back-rest will be held in a corresponding position. For this purpose the locking member 48 has a central aperture through which the locking rod 42 passes and has a ridge or rib 56 extending diametrically thereacross. A tongue 58 rises from the same surface of the locking member 48 which has the rib 56, the tongue being located in the slot of the arm to prevent excessive rotation of the locking member 48 with respect to the arm 22. The rib 56 is used to provide a firm contact element for the surface of the wedge-shaped cam 28.

Although the locking member 48 is held in place directly against the outer surface of the cam 28, the locking member 60 (Figures 6 and 7) which coacts with the cam of the arm 24 is retained in place by additional means (Figures 4 and 5). The locking member 60 comprises a plate 62 with a central aperture 64 therein through which the locking rod 42 passes, together with a tongue 66 and a diametric rib 68, the tongue and rib rising from the same surface of the plate 62. The rib 68 is adapted to contact the cam 28 of the arm 24, while the tongue 66 is located in the slot 30 in order to prevent excessive rotation of the locking member 60 with respect to the arm 24. On the substantially planar outer surface of the locking member 60 there is an anti-friction bearing 70 having a spring 72 concentrically arranged therewith, the spring seating against the planar surface of the locking member 60 and also against a washer 74 which is fitted on the locking rod 42. The knob 46 bears against the washer 74 so that upon rotation of the knob 46 the spring 72 bears against the locking member 60 yieldingly pressing it against the cam 28 and at the same time the rod 42 shifts axially because it is being shortened in effective length, thereby pulling the locking member 48 against the cam of the arm 22. In operation of this portion of the device the knob 46 is rotated so as to loosen it whereby the locking members 48 and 60 are maintained loosely against the cams of the arms 22 and 24. At this time the back-rest frame 12 may be rotated about the pivot pins 27 as axes inasmuch as these pins connect the arms 22 and 24 and their brace arms 40 to the seat frame 10 and the brace arms together with arms 22 and 40 are slidably connected with the back-rest frame 12. However, when the knob 46 is tightened on the locking rod 42 the locking members 60 and 48 are fastened firmly against the cams at the lower ends of the arms 24 and 22, thereby holding the arms 22 and 24 against further pivotal movement and hence, holding the back-rest frame 12 in a fixed position.

After the back-rest frame has been moved to a vertical position, it may still be adjusted forward further inasmuch as the slots 30 at the lower ends of each arm 22 and 24, are formed in a flat portion of the arms rather than the wedge-shaped cams 28. Accordingly, as function of the length of the slots 30, the back-rest frame 12 may be adjusted forward to any desired position, even to the extent that the dihedral angle between the seat frame and the back-rest frame is less than ninety degrees.

In order that there will be sliding movement between the arms 22 and 24 and the back-rest frame 12, brackets 80 and 82 are secured to opposite rear corners of the seat frame 10 and links 84 and 86 are pivoted to the upper ends thereof. These links are connected to the back-rest frame 12 so that upon pivotal movement of the back-rest frame 12, the arms 22 and 24 will slide in their guides or guideways. As disclosed in Figure 1, the back-rest frame is substantially rectangular in shape including in addition to the bracing 18, a top member 90, sides 91 and 92 and a bottom member 93. This entire unit is adapted to shift with respect to the arms 20 and 22 due to the presence of the links 84 and 86. Since the links 84 and 86 are pivoted in advance of the pivotal connection for the arms 22 and 24, the unit defined by the sides, top and bottom of the back-rest frame 12 will extend and retract, the extended position being when the back-rest frame 12 is substantially vertical and the retracted position with respect to the arms 22 and 24 being when the back-rest frame is substantially horizontal.

Having described the invention, what is claimed as new is:

1. In combination, a seat frame and a back-rest frame, means pivotally connecting confronting ends of said frames and for retaining said back-rest frame in selected pivoted positions with respect to said seat frame, said retaining means including an arm slidably connected to said back-rest frame, a link pivoted to said seat frame and connected to said back-rest frame, said arm having a cam provided with a slot, a locking rod disposed in said slot, and a locking member carried by said locking rod and contacting said cam to hold said arm releasably fastened to said locking rod.

2. The combination of claim 1 and said arm being pivoted to said seat frame, said slot being curved and arranged on an arc with the pivotal connection of said arm and said seat frame being the center of pivotal movement of said arm with respect to said seat frame.

3. The combination of claim 2 and said slot being sufficiently long to extend into the material of said arm beyond said cam so that said arm and said back-rest frame may be pivotally moved to such position that the back-rest frame and seat frame have a dihedral angle less than ninety degrees.

4. The combination with a back-rest frame and a seat frame, of an assembly to hold said back-rest frame releasably in selected pivoted positions with respect to said seat frame, said assembly including a link pivoted to said seat frame and connected to said back-rest frame, an arm, means slidably connecting said arm with said back-rest frame, and said arm being pivotally secured to said seat frame, a locking rod, said arm having a cam provided with a slot which accommodates said locking rod, and a locking member engaging said cam and carried by said locking rod.

5. The combination with a back-rest frame and a seat frame, of an assembly to hold said back-rest frame releasably in selected pivoted position with respect to said rest frame, said assembly including a link pivoted to said seat frame and connected to said back-rest frame, an arm, means slidably connecting said arm with said back-rest frame, and said arm being pivotally secured to said seat frame, a locking rod, said arm having a cam provided with a slot which accommodates said locking rod, and a locking member engaging said cam and carried by said locking rod, adjustable means carried by said locking rod for pressing said locking member in engagement with said cam.

6. The combination with a back-rest frame and

a seat frame, of an assembly to hold said back-rest frame releasably in selected pivoted position with respect to said rest frame, said assembly including a link pivoted to said seat frame and connected to said back-rest frame, an arm, means slidably connecting said arm with said back-rest frame, and said arm being pivotally secured to said seat frame, a locking rod, said arm having a cam provided with a slot which accommodates said locking rod, and a locking member engaging said cam and carried by said locking rod, adjustable means carried by said locking rod for pressing said locking member in engagement with said cam, said locking member comprising a plate with a rib on one surface thereof frictionally engaging said cam, and a tongue extending from said plate and disposed in said slot to limit the rotation of said plate on said rod.

7. The combination of claim 4 and a second arm slidably connected to said back-rest frame at a location spaced from the first mentioned arm, said second arm having a cam provided with a slot, said locking rod being passed through the last mentioned slot, and means carried by said locking rod and engaging the last mentioned cam for releasably fastening said arm to said locking rod.

8. The combination of claim 7 and means pivoting said second arm to said seat frame, and a second link pivoted to said seat frame and connected to said back-rest frame.

9. The combination of claim 1 and the pivotal connection of said link being spaced from the pivotal connection of said arm and said seat frame so that upon pivotal movement of said back-rest frame with respect to said seat frame, said back-rest frame is extended with respect to said seat frame.

HERMAN H. EICHORST.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,147,439	Herold	Feb. 14, 1939
2,290,672	Cantor	July 21, 1942

FOREIGN PATENTS

Number	Country	Date
848,742	France	July 31, 1939
275,737	Great Britain	Aug. 17, 1927