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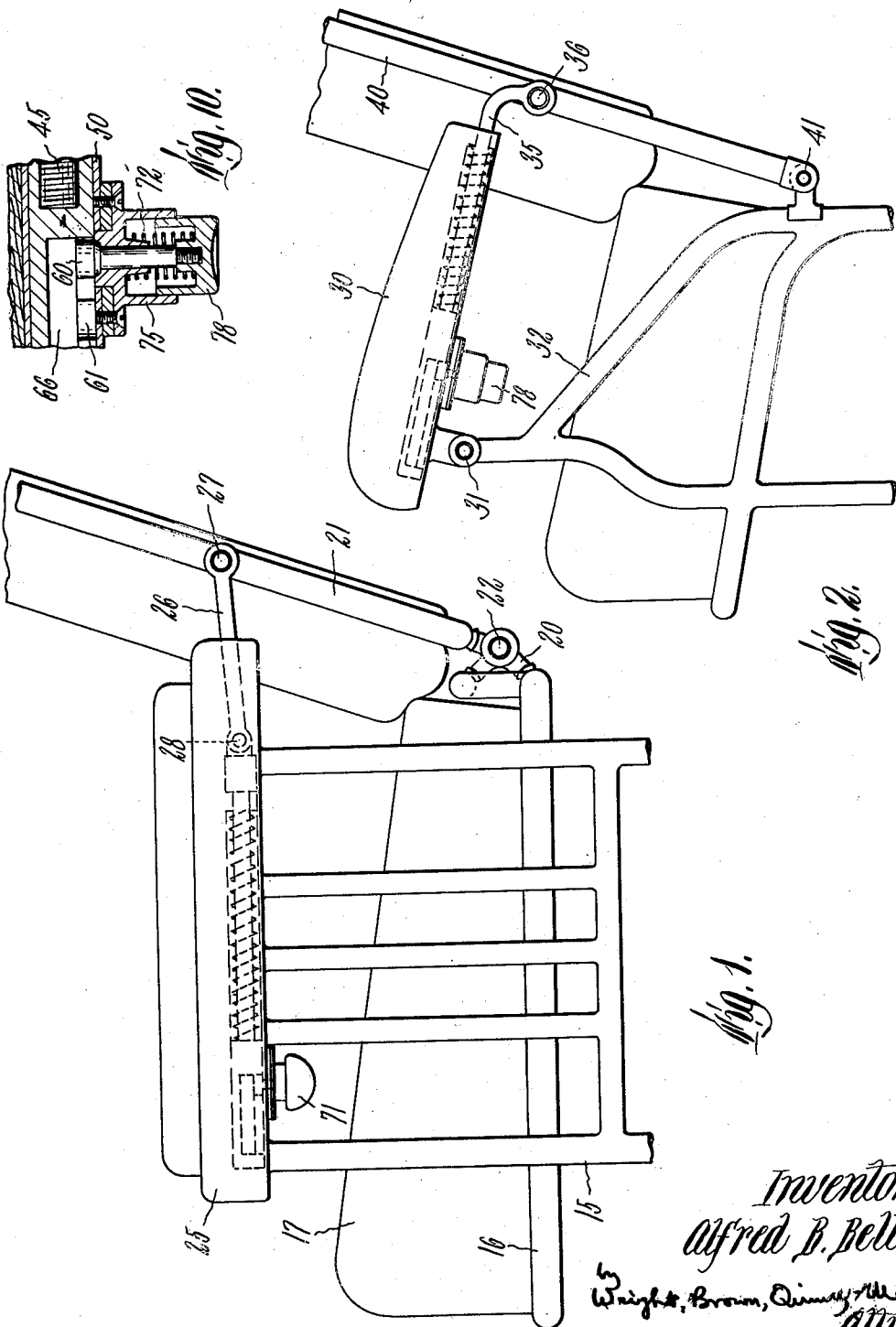
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RECLINER MECHANISM FOR CHAIRS

Filed May 29, 1935

2 Sheets-Sheet 1



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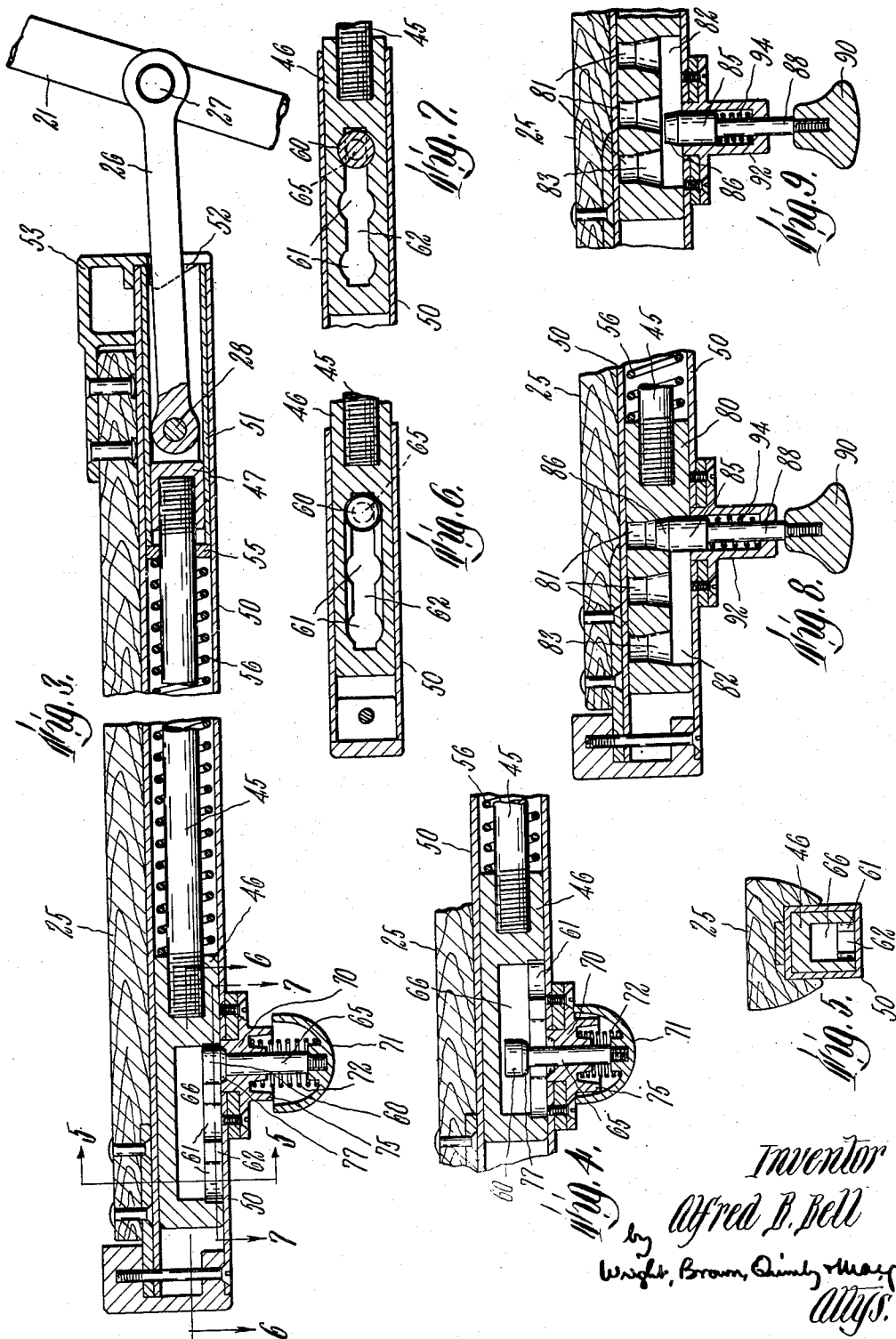
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UNITED STATES PATENT OFFICE

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RECLINER MECHANISM FOR CHAIRS

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1 Claim. (Cl. 155—163)

This invention relates to a recliner mechanism for facilitating the adjusting of a chair back to various angles of inclination.

In railroad cars and busses it is often desirable to adjust the angle of inclination of the chair back so as to vary the posture of the passenger from time to time during a long train or buss ride.

It is an object of the present invention to provide a mechanism for facilitating the adjustment of the seat back to various angles, such mechanism being characterized by simplicity of structure, ruggedness, and ease of operation.

For a more complete understanding of the invention, reference may be had to the disclosure thereof in the description which follows, and on the drawings of which

Figure 1 is a side elevation of a chair embodying the invention.

Figure 2 is a side elevation of a slightly different form of chair embodying the invention.

Figure 3 is a view in longitudinal section showing the working parts of the mechanism.

Figure 4 is a fragmentary portion of Figure 3 showing the parts in a different position of operation.

Figure 5 is a section on the line 5—5 of Figure 3.

Figure 6 is a section on the line 6—6 of Figure 3.

Figure 7 is a section on the line 7—7 of Figure 3.

Figure 8 is a fragmentary sectional view of a modified form of adjusting apparatus.

Figure 9 is a portion of Figure 8 showing the parts in a different position of operation.

Figure 10 is a fragmentary sectional view of another modified form of adjusting apparatus.

The invention may be embodied in mechanism which, as indicated in Figures 1 and 2, may be installed in the arm rest of a chair. Figure 1 illustrates a chair having a frame 15 on which is mounted a seat frame 16 carrying a cushion 17. The seat frame may be constructed of any suitable materials, metal tubing being shown by way of illustration. A pair of suitable hinge brackets 20 may be secured to the seat frame 16, a seat back 21 being pivotally mounted on the brackets 20 as at 22. The chair frame 15 carries one or more arm rests 25 in which is mounted improved mechanism for facilitating the adjustment of the angle of inclination of the chair back 21. This mechanism is connected to the chair back as by a suitable link 26 which is pivoted to the chair

back as at 27 and may be pivoted to the adjusting mechanism as at 28.

Figure 2 shows a slightly different manner of employing the adjusting mechanism. In this form, an arm rest 30 is pivotally mounted under its forward end portion as at 31 to the side frame 32 of the chair. The adjusting mechanism includes a member 35 which projects rearward and is pivotally attached as at 36 to the chair back 40, the chair back being pivotally attached to the frame 32 of the chair as at 41.

Figure 3 illustrates in detail the mechanism as employed on the chair shown in Figure 1. As therein shown, the link 26 is pivotally attached to a plunger comprising a rod 45 having end pieces 46 and 47 threaded thereon or otherwise secured thereto. These end pieces are preferably of non-circular cross section so as to prevent rotative movement thereof when in the housing 50. Where either of the end members is connected to the rod 45 by screw threads, as shown, the combined length of the end members and rod may be varied by rotation of one of the end members on the rod before insertion into the housing. This facilitates small adjustments of the inclination of the seat back so that the seat backs in a railway car may be adjusted to uniformity when the backs are all in the upright or normal position. The end member 46 is adapted to slide easily in the housing 50 which is of rectangular cross section, and which is a portion of the arm-rest structure. The end member 47 slides in a suitable sleeve 51 fixed within the rear portion of the housing 50, the rear ends of the housing and sleeve being supported by a pair of ears 52 formed on the rear cap 53 of the arm-rest 25. These ears enter the upper rear end of the housing and sleeve and are provided with flat tops to support this end of the housing, the forward end of the housing being supported by a screw which is shown near the left hand extremity of Figure 3. A suitable washer 55 bears against the forward end of the sleeve 51, the washer being either loose or secured to the end of the sleeve, as desired. The rod 45 projects through a central aperture in the washer 55. A compression spring 56 is provided in the casing, this spring surrounding the rod 45 so that one end of the spring presses against the rear face of the end member 46 while the rear end of the spring presses against the washer 55. As the spring 56 is normally under compression, it constantly exerts a forward push against the slidable end member 46. Since the end member 46 is connected through the rod 45, the end member 47

and the link 26 to the chair back 21, the effect of the spring is to exert a constant forward pull on the chair back 21.

In order to maintain the chair back locked in one or another of a series of positions of adjustment, a locking member 60 is provided to engage in any one of a series of holes 61 in the bottom of the member 46. As indicated in Figure 6, the holes 61 are connected by a longitudinal slot 62 having a width less than the diameter of the holes 61. The locking member 60 is integral with or secured to a stem 65 which has a reduced diameter so as to be able to move laterally in the slot 62. The interior of the member 46 is preferably hollowed as at 66 to provide a chamber into which the locking member 60 can be moved so as to release it from engagement in one or another of the holes 61.

When the locking member 60 is in the rear-most hole 61, as in Figure 3, the seat back is in its normal position for sitting. When the member 60 is in one of the other holes 61, the seat back is in one or the other of its reclining positions. The pressure of the spring 56 tends to rock the seat back to its normal position and is preferably of sufficient magnitude to rock the seat back against gravity when the locking member is clear of the holes 61. The spring 56 also serves to prevent rattling by taking up any lost motion or back-lash between the operating points. For the operation of the locking member 60, a fixture 70 may be secured to the under face of the casing 50, the fixture 70 having a vertical bore in which slides the stem 65 of the locking piece 60. At the lower end of the stem 65 is mounted a suitable knob 71 which may be of any convenient size or shape. As shown, it may be made in the form of an approximate semisphere, a compression spring 72 being employed to bear against the inside of the knob and against the fitting 70 so as to press the knob yieldingly downward. A guard flange 75 may be formed on the fitting 70 to telescope with the knob 71 so as to protect the fingers of the operator from contact with the spring 72. If preferred, the knob may telescope inside of the guard flange, as shown in Figure 10, instead of outside. In such case, the knob 71 may be cylindrical for a snug sliding fit within the flange 75.

In operating the mechanism, the occupant of the chair presses upward on the knob 71 so as to cause the locking member 60 to move clear of the hole 61 in which it is engaged and to enter the chamber 66, thus unlocking the member 46. The end walls of the chamber 66 define the extreme limits of rocking movement of the seat back, such limits being adjustable by varying the over-all length of the plunger 46, 45, 47 as hereinbefore described. While the knob 71 is held in its raised position, as shown in Figure 4, the chair back 21 is adjusted forward or rearward by allowing the spring 56 to move the chair back forward, or by leaning back against the chair back to push it rearward. When the chair back has reached the desired position of adjustment, the knob 71 is released so that the lock-

ing member 60 is permitted to enter one of the holes 61. It may be necessary to adjust the chair back slightly in order to bring the locking member 60 into alignment with one of the holes 61 so that it can enter thereinto. As shown, the shoulder between the locking member 60 and its stem 65 may be beveled, as at 77, to guide the locking member 60 into the holes 61 and to take up lost motion when in locked position.

If desired, the mechanism may be so constructed as to require downward movement of the knob to release the locking member. Such mechanism is illustrated in Figures 8 and 9. As therein shown, a forward sliding member 80 is provided with a series of holes 81 above a chamber 82, these holes being flared as at 83 to facilitate the entrance of a locking member 85 thereinto. The upper end of the locking member 85 may be beveled as at 86 so as to fit snugly into the flared portion 83 of any of the holes 81, thus taking up lost motion between the locking member and the slide 80. The locking member 85 is secured to or integral with a stem 88, on the lower end of which is a knob 90 by which the locking member 85 may be pulled down clear of the holes 81. A fitting 92 is secured to the lower face of the casing 50, the fitting 92 being suitably shaped to hold a compression spring 94 which bears against a shoulder between the locking member 85 and its stem 88 so as to press the locking member 85 upwardly. The operation of the mechanism is substantially the same as the operation of the mechanism shown in Figure 3, except that the locking element is moved downward to free the slide rather than upward as in the mechanism shown in Figure 3.

It is evident that various changes and variations in details of structure of the invention herein shown and described may be made without departing from the spirit or scope of the invention as defined by the following claim.

What I claim is:

In a recliner mechanism for a seat having a side arm and a rockable back thereon, a slidable member connected to said back and slidable in said arm in a front and rear direction, said member having in the forward end portion thereof an elongated chamber of limited length and a slot opening into said chamber from the bottom of said member, said slot being narrower than said chamber but having a plurality of widened portions spaced therealong, a locking plunger carried by said arm and movable at right angles to the direction of movement of said member to and from a position of locking engagement with said member, said plunger having a locking element adapted to fit into any one of said widened portions of said slot to lock the member against movement, said plunger having a stem portion adapted to ride in said slot when the locking element is moved clear of said widened portions of the slot, whereby the range of movement of said member is limited.

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