

Nov. 9, 1948.

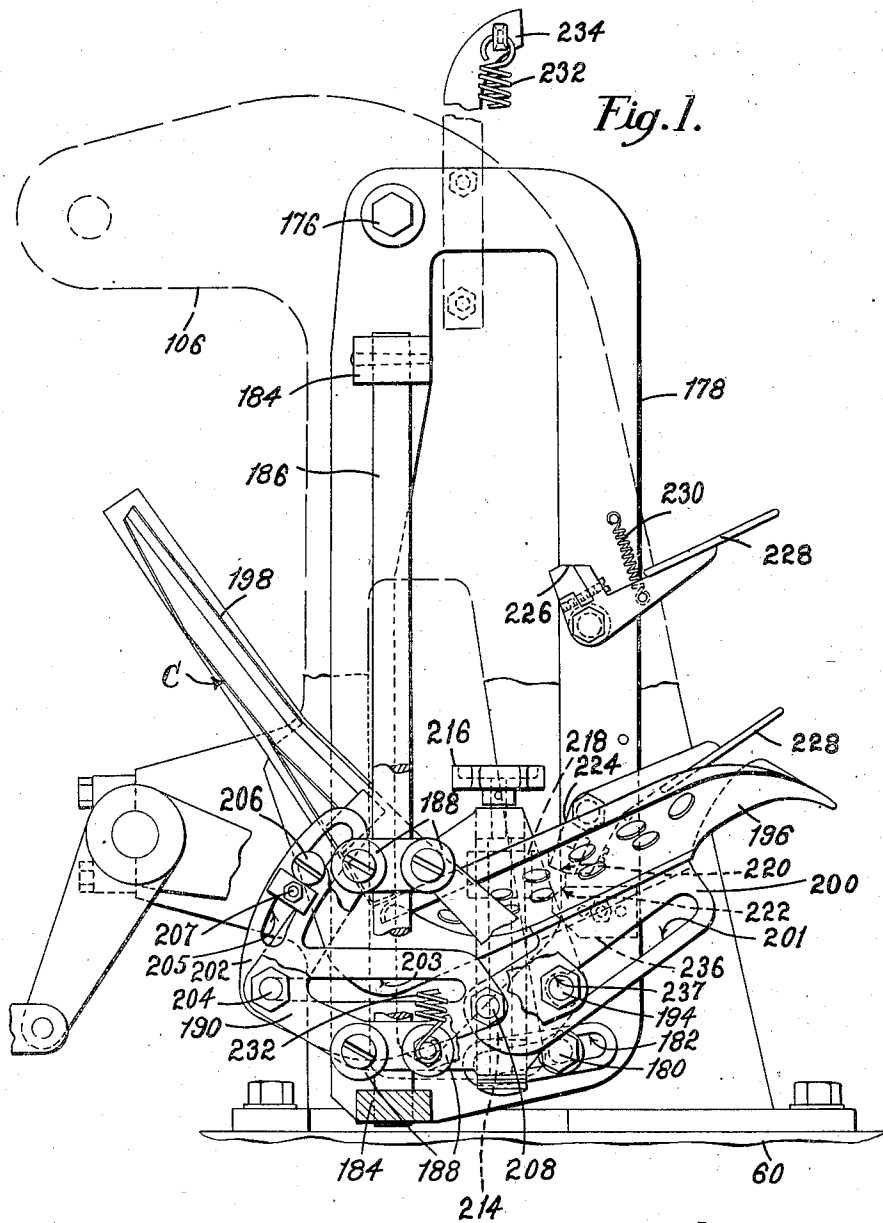
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2,453,208

ADJUSTABLE CHAIR FOR GUNNERS

Original Filed April 13, 1945

3 Sheets-Sheet 1



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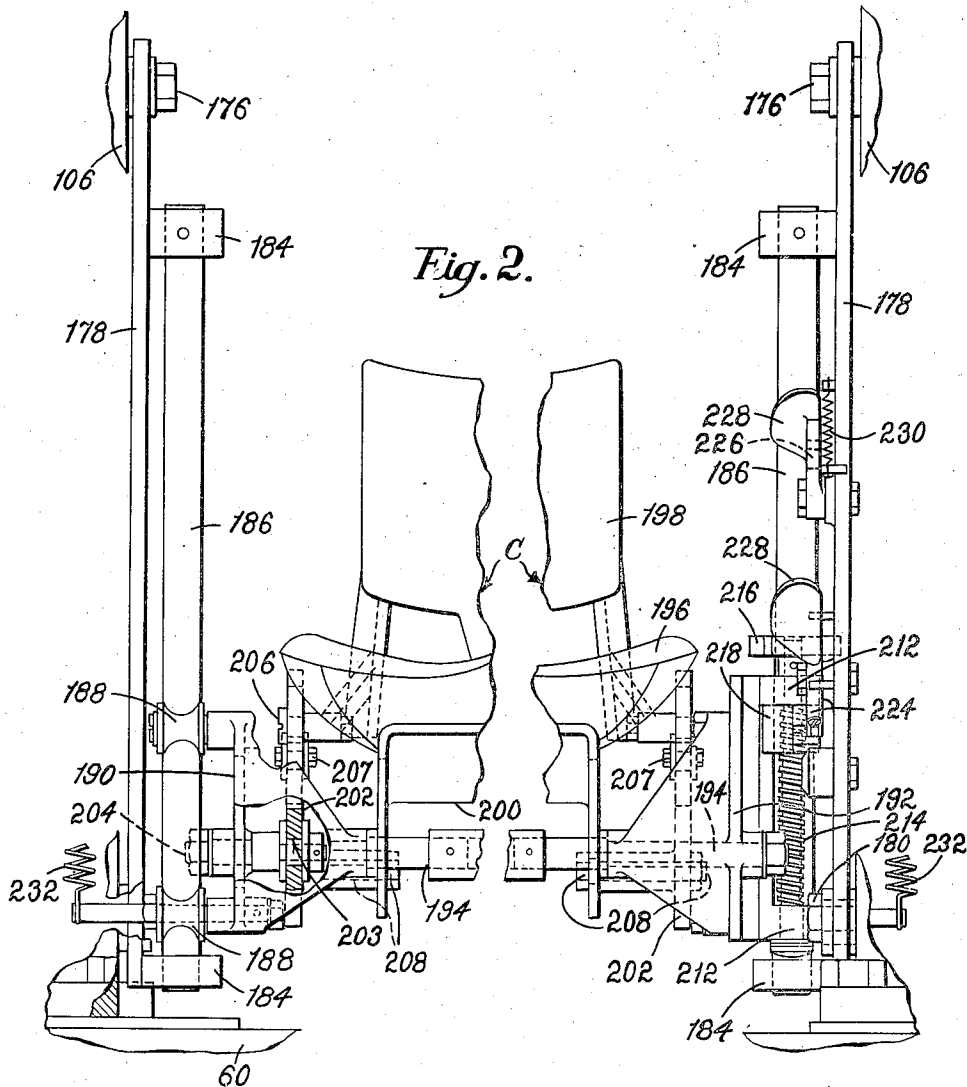
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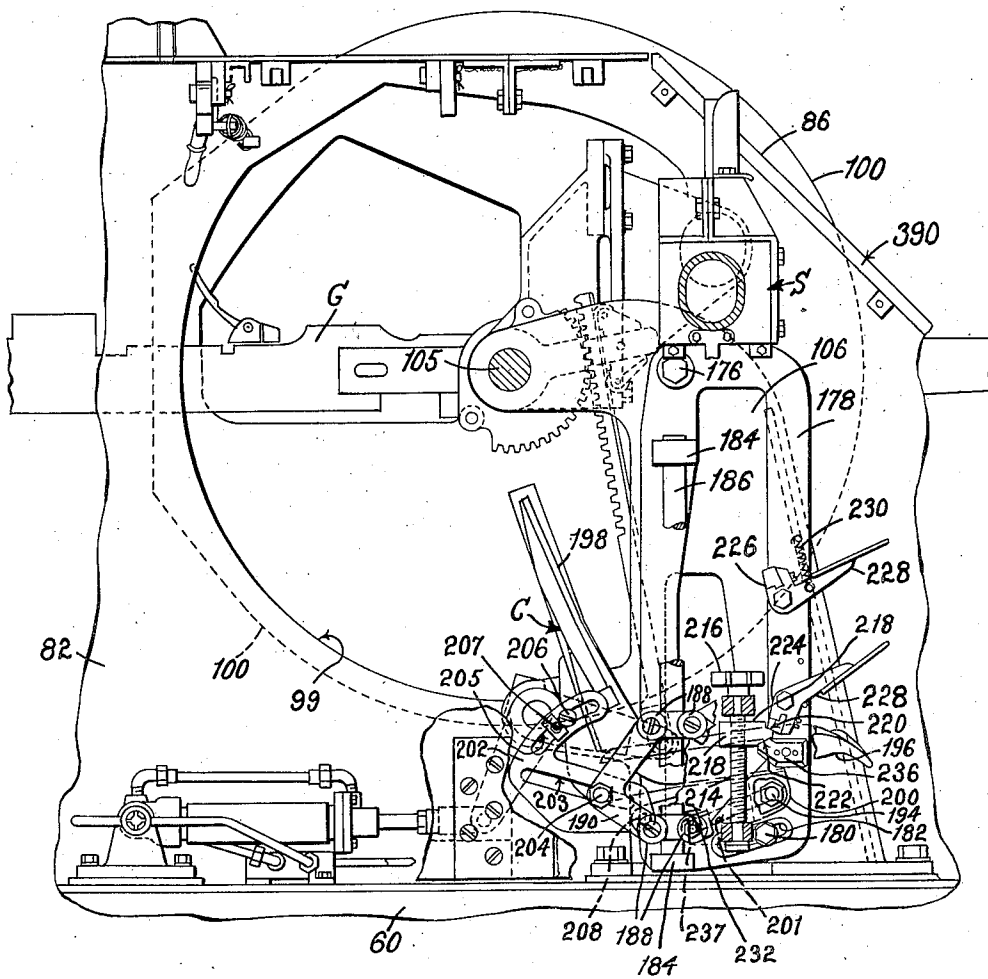
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Fig. 3.



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UNITED STATES PATENT OFFICE

2,453,208

ADJUSTABLE CHAIR FOR GUNNERS

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Original application April 13, 1945, Serial No.
588,176. Divided and this application May 20,
1946, Serial No. 670,927

3. Claims. (Cl. 155—5)

1

This invention relates to chairs, and especially those adapted to position the occupant at different heights and at different angles in a vertical plane.

Chairs of the character above mentioned are used for the operators of guns mounted, for example, within a turret and directed in their fire by a sight, the gun and sight being movable together. The gunner may wish to be so raised that his outlook enables him to scan his surroundings or lowered for action with his eye disposed in a relation which will enable him to look conveniently through the sight and to follow said sight in its movement. It is an object of my invention to enable the gunner, or other occupant of the chair, quickly and with but little effort, to cause it to assume the desired positions and such relations as will best suit his needs. To this end, I combine with a support, as spaced standards rising from the floor or table of a turret, a mounting member movable upon the support means for securing the mounting member in different angular positions, and a chair movable upon the mounting member to different angular and vertical positions. With this capacity of the chair for independent adjustment of its mounting and by its mounting, separate requirements as to position may be met. There is preferably means for retaining the chair at one extreme of movement upon its mounting, rearward for example; such means requiring for its release only pressure upon the chair by the occupant, the extent of movement to the opposite extreme being variable. The height of the chair may be determined by the location of a carrier upon the supports. As herein disclosed, the chair-carrier is movable along guide means, and there are upper and lower latches for engagement with surfaces upon the chair to hold said chair in its opposite extremes of elevation, the upper extreme being preferably produced by a spring and the lower by the weight of the chair with its associated supporting and controlling elements, plus the weight of the occupant. The movement-limiting surfaces are preferably upon a retaining member variable in position, this member being conveniently positioned by a nut movable upon a screw rotatable in the chair-carrier.

The present application is a division of an application filed in my name in the United States Patent Office on April 13, 1945, and bearing the Serial No. 588,176.

The accompanying drawings illustrate one of the several possible embodiments of the invention,

2

Fig. 1 being a side elevation of the improved chair, with its adjusting mechanism;

Fig. 2, a broken front elevation of the chair; and

Fig. 3 shows said chair in side elevation arranged for use by a gunner in a gun-turret and in position preparatory to scanning.

At 60 is indicated the table or floor of a turret having opposite side walls, one of which is indicated at 82, and a front wall 86 (Fig. 3). In each side wall is an opening 99, outside of which is rotatable a disk or plate 100 fast upon a horizontal spindle 105 rotatable in standards 106, 106 rising from the floor 60. Upon the exterior of the plate a gun G is mounted, it being directed in elevation by the rotation of the plate as determined by a sight S movable with the plates and gun at the rear of an opening 390 in the wall 86. The target for the gun is viewed through the sight by a gunner occupying a chair C, which is the subject of the present invention. Pivoted at 176 near the upper portion of each standard 106 is a mounting plate 178, which may be retained in different angular positions about its pivot by the screw 180 passing through an arcuate slot 182 in the bottom of the plate and threaded into the standard. Fixed in upper and lower lugs 184, 184 upon the inner side of each plate is a vertical rod 186. Guided by the rods are upper and lower pairs of rolls 188, 188; the grooved peripheries of which partially embrace said rods. The rolls are rotatable on a carrier 190, at the right of the occupant of the chair, and on a left-hand carrier 192, joined by a tie-rod 194 to furnish a carrier-frame traveling on the rods 186. The chair C, having a seat 196 and a back 198, is supported upon the tie-rod by a yoke 200 secured to the forward portion of the seat and having transversely-spaced slots 201, 201 through which the tie-rod passes to serve as a guide. The slots are inclined upwardly toward the front of the seat. The chair may thus tilt forward and back and also move bodily upon the tie-rod as a guide. At the rear of each of the carriers 190 and 192, a bell-crank-link 202 has a lower arm extending in a generally horizontal direction, in which arm is a longitudinal slot 203 receiving a guide-projection 204 from the carrier. Each lower link-arm is pivoted at 208 to the rear of one side of the yoke 200. The links may thus float upon the carriers having a compound movement similar to that of the chair. An upwardly extending arm of each link has an arcuate slot 205 through which extends a projection 206 from the chair-back. Below the projection a stop 207 is

clamped to the link and may be adjusted to different positions, to limit the degree of rearward inclination of the chair-back and the angle at which the eye of the gunner is presented to the sight. Excessive forward displacement will be prevented by engagement of the projections 206 with the upper ends of the slots 205.

In upper and lower lugs 212, 212 on the carrier 192 is journaled a vertical screw 214 rotatable by a hand-wheel 216 fixed to its upper extremity. Rotation of the screw raises or lowers a nut 218, held against turning by engagement with a wall of the carrier along which it moves. The nut has an upper contact-surface 220 and a lower contact-surface 222. These surfaces may be engaged, respectively, by latches 224 and 226 pivoted on the left-hand mounting-plate 178 and each provided with a hand-hold 228. The latches may be held in normal position for engagement with one of the contact-surfaces of the nut 218 by a spring 230, as shown for the latch 226, and by gravity, as is the latch 224. A tension-spring 232 joins each of the carriers to a bracket 234, rising from the corresponding standard 106. The springs tend to lift the chair until its travel is stopped by the engagement of the upper rolls 188 with the upper lugs 184. Under the influence of the occupant's weight, the chair will descend until the surface 222 of the nut 218 strikes a stop-plate 236 secured to the left-hand plate 178.

In the lowered position, in which the gunner discharges the gun G as directed by the sight S, the chair is held by engagement of the latch 224 with the nut-surface 220. When the gunner wishes to scan, he releases the latch 224 by depressing its hand-hold 228 and partially relieves the chair of his weight. The springs 232 lift it, the nut 218 thrusting aside the latch 226. When the gunner's weight is again applied to the chair, the nut surface 222 rests upon the latch 226, and the chair is held up until pressure upon the upper hand-hold 228 frees it, to descend to its initial firing position under the weight of the gunner. To bring his eye into the best vertical relation to the sight, the gunner may raise or lower the chair C by turning the screw 214 through rotation of the hand-wheel 216. This will shift the nut 218 correspondingly, and thereby vary the vertical relation of the nut-surface 220 which contacts the lower latch 224 when the chair is in firing position. When the gunner leans back for firing at the maximum elevation, the chair is in the position appearing in Fig. 1. The chair-back is tilted rearwardly to the angle permitted by the adjustable stops 207, and the seat has slid forward on the rod 194, an offset-portion 237 at the end of the upper edge of each slot 201 receiving the rod and tending to retain the chair against clockwise displacement. If this angular position of the chair places the eye of the gunner too far from or too near to the sight S, this may be corrected by angular adjustment of the mounting plates 178 carrying the chair, this adjustment being secured by the screws 180. As the guns and sight are lowered and the body of the gunner is inclined forwardly, the chair follows the change in their direction by tilting for-

ward about the rod 194, the slot-offsets 237 remaining in engagement with this. After firing, if the gunner wishes to scan from the chair, raised from the latch 224 and held by the latch 226, he leans forward, lifting and pressing back upon the front of the seat. The slot-offsets now leave the rod 194, and the yoke 200 slides rearwardly upon said rod, until the forward extremities of the slots reach it (Fig. 3). At the same time, the links 202 move back along the carrier-projections 204, and the chair-projections 206 may shift toward the upper ends of the slots 205, depending on the position of the body of the gunner. He has thus been carried rearwardly sufficiently to avoid contact with the sight as he rises.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. The combination with spaced standards, of a plate pivoted upon each standard, means for securing the plates in different angular positions, a carrier guided for movement upon the plates, means arranged to variably position the carrier upon the plates, a chair mounted to tilt upon the carrier, and means arranged to variably limit the movement of the chair.

2. The combination with mounting members, of opposite guide-rods thereon, carriers having guide-rolls running upon the rods, a tie-rod connecting the carriers, a chair supported upon the tie-rod, a retaining member movable upon one of the carriers and provided with upper and lower surfaces, and lower and upper latches movable upon one of the mounting members for respective engagement with the surfaces of the retaining member.

3. The combination with guide means, of a carrier movable thereon, a gunner's chair mounted upon the carrier, a spring for elevating the carrier along the guide means, upper and lower latches associated with the guide means, a screw rotatable upon the chair-carrier, and a nut upon the screw, said nut being held against rotation and provided with lower and upper surfaces for respective engagement with the latches.

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