MOUNTING FOR MACHINE GUNS CARRIED BY AIRCRAFT

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This invention relates to mountings for machine guns carried by aircraft, of the kind comprising a post upon the upper end of which the machine gun is trunnioned for elevational movements and which is pivotally connected to a training member at a point some distance removed from the training axis so that it can be adjusted into different angular positions. According to the present invention the post has pivoted thereto a stay member the lower end of which is connected to a member slidably carried by the training member to which it can be connected by a suitable device in different positions corresponding to the different angular positions it is required to give to the post. The said construction provides a triangular structure which, whilst being deformable at will to vary the angular position of the post, gives the necessary rigid support for the gun. The training movement of the training member may be effected by a cranked handle through chain and sprocket gearing and bevel wheels, one of the sprockets being mounted co-axially with respect to the pivot connecting the post to the training member so that the gearing is not affected by the angular adjustments of the post.

In order that the said invention may be clearly understood and readily carried into effect the same will now be described more fully with reference to the accompanying drawings wherein:

Figures 1, 2, and 3, are a side elevation, plan, and front elevation respectively, of a gun mounting made in accordance with the invention in position in the gunner’s cockpit of an aeroplane, the surrounding portion of the aeroplane fuselage being indicated in dot and dash lines and the gunner and machine gun being also similarly indicated in Figure 1;

Figures 4, 5, and 6, are enlarged views of portions of Figures 1, 2, and 3, respectively; and

Figures 7, 8, and 9, are a side elevation, a plan, and a front elevation, respectively, of the top of the post, these figures showing various adjustments of the machine gun in dot and dash lines.

The post A (which is preferably made telescopic) carries the machine gun B at its upper end and its lower end is pivoted at d to a bifurcated extension d’ on the forward end of a bar D forming part of the training member. This bar is mounted in a bracket D1 connected to the upper end of a hollow vertical pivot E. Pivotated at F to the post A is the stay member which comprises two arms F1 the upper ends of which are connected to the pivot F and the lower ends of which are pivoted at f to opposite sides of a slide F2 which is mounted for horizontal sliding movement in guideways F3 with which the bracket D1 is provided. The slide F2 can be fixed in its adjusted position by means of a spring bolt F4 which can be engaged in any one of a series of apertures or depressions F5 in the upper surface of the bracket D1. When the post A is adjusted about the pivot d the slide F2 will be moved backwards or forwards and the arm and post maintained in their adjusted positions by the bolt F4. The bar D extends through the bracket D1 and carries at its rear end a vertically adjustable seat D2 for the gunner.

For training the training member composed of the bar D and the bracket D1 a fixed tube E1 surrounding the pivot E is provided at its upper end with a bevel wheel G which gears with a similar wheel G1 that is mounted in bearings carried by the bracket D1. Secured to the wheel G1 is a sprocket G2 that is connected by a chain G3 to a sprocket G4, which is pivoted on the bar D coaxially with respect to the pivot d and in turn is connected by a chain G5 to a sprocket G6 mounted on a spindle G7 carried by the post A which spindle also carries a hand wheel G8 having a cranked handle G9 whereby the spindle and sprockets can be rotated thereby rotating the bevel wheel G on the fixed bevel wheel G1, thereby training the bar D, the bracket D1 and the parts carried thereby. The gunner of course will rotate with the bar D and the bracket D1 which can be locked in the adjusted position by a bolt H which is carried by a part attached to the pivot E and is pressed upwardly by a spring H2 so as to enter any one of a series of holes H1 in the floor of the cockpit or in a metal plate attached thereto. For withdrawing the bolt from the hole when the training member is to be trained, a lever H3 is provided one end of which is connected to the bolt H and the other end of which is connected by a steel cable H4 and rod H2 to a pedal H5 which is located in a position convenient for operation by the heel of the gunner. The cable H4 passes through the hollow pivot E and over suitable pulleys H6. The rod H2 passes through a guided way H10 and is surrounded by a spring H7 that acts between a plate P and a collar A on the rod H2 and assists the spring H7 in returning the locking bolt H and parts connected to it to their normal post. 110
tions. The pedal \( H^4 \) is pivoted at \( h \) to the lower enlarged end of one of a pair of uprights \( M^3 \) which carry foot rests \( M \) at their lower ends and one of which also carries the guideway \( H^2 \). The uprights \( M^4 \) are bolted to the aforesaid bar \( D \) at their upper ends by a clamp \( M^3 \) and their lower ends are connected by the plate \( P \) for rigidity and spacing purposes, which plate moves with the said bar in training and is rotatable with respect to the fixed tube \( E^4 \). The aforesaid bar \( D \) is made movable axially on the bracket \( D^1 \) for adjusting the chain \( Q^2 \) and suitable means are provided for locking the said bar in its adjusted position.

The upper end of the post \( A \) has a socket to receive a pin \( J \) on the lower end of a member \( J^3 \) to which is pivoted \( J^4 \) the upwardly projecting furcations \( J^3 \) of a bracket which has upwardly extending furcations \( J^3 \) to which the machine gun is pivoted at \( J^1 \). The machine gun can be elevated or depressed about the pivot \( J^4 \) as indicated in dotted and dashed lines in Figure 1. The machine gun can also be trained into different positions as indicated in Figure 2 by means of the socket and pin \( J \) and can be tilted from side to side about the pivot \( J^4 \) as indicated in Figure 3.

The lower end of the pivot \( E \) below the floor of the cockpit is provided with a crank \( K \) to which a rod \( K^2 \) is pivotally connected at \( K^3 \). The rod is under the influence of a spring \( K^4 \) and is guided in a cylinder \( K^3 \). This arrangement serves to counterbalance the wind pressure on the gun when it tends to move the gun and the machine gun and mounting about the pivot \( E \).

By reason of this improved construction of the gun mounting it is possible to reduce the width of the cockpit and the fuselage and thereby decrease wind resistance. The said construction also gives more accommodation for the gunner when the gun is being fired at high angles of elevation and also when it is being fired at considerable angles of depression.

What we claim and desire to secure by Letters Patent of the United States is:

1. In a machine gun mounting for aircraft, the combination of a training member, a post the upper end of which carries the gun and the lower end is pivotally connected to said training member at a point some distance from the training axis of said member, training mechanism including chain and sprocket gearing, one of the sprockets being mounted co-axially with respect to the pivot connecting the post to the training member, and a hand operated device for driving said sprocket gearing.

2. In a machine gun mounting for aircraft, the combination of a post carrying the gun at its upper end, a training member carrying said post, a hollow training pivot connected to said training member, a spring controlled locking bolt carried by a part rotating with said hollow training pivot, said bolt engaging in any one of a series of holes in a fixed part so as to lock said training member in its adjusted position of training, an operating lever rotating with said training member, and a cable which passes through said hollow training pivot and which serves to transmit movement from said lever to said bolt for withdrawing said bolt from its hole when required.

3. In a machine gun mounting for aircraft, the combination of a post carrying the gun at its upper end, a training member carrying said post, a training pivot connected to the training member, a crank on the lower end of said training pivot, and a spring controlled wind balancing device operated by said crank, a spring controlled locking bolt carried by said training member for engaging any one of a series of holes in a fixed part so as to lock said member in its adjusted position of training, and means for withdrawing said bolt from its hole when required.

4. In a machine gun mounting for aircraft, the combination with the elements claimed in claim 2, of a crank on the lower end of the hollow training pivot, and a spring controlled wind balancing device operated by said crank.

5. In a machine gun mounting for aircraft the combination of a training member, a gunner's support carried by said training member behind the training axis of the latter, a post the upper end of which carries the gun and the lower end is pivotally connected to said training member on an axis fixed with respect to the training member and which axis is located some distance in front of the training axis of said member, a stay member disposed behind the post and pivoted at its upper end to said post, a slidable member carried by said training member, means for pivotally connecting the lower end of said stay member to said slidable member, and means for connecting said slidable member to said training member in different positions corresponding to the different angular positions to be given to the post.

6. In a machine gun mounting for aircraft, the combination of a training member, a gunner's support carried by said training member behind the training axis of the latter, a post the upper end of which carries the gun the rear end of which is restricted in movement only by the connection of the gun to the upper end of the post so that said rear end is free to be moved by hand, a pivotal connection between the lower end of the post and said training member at an axis fixed with respect to the training axis of said member, a support member connected to said post and pivoted at its upper end to said support member, means for pivotally connecting the lower end of said support member to said slidable member, and means for connecting said slidable member to said training member in different positions corresponding to the different angular positions to be given to the post.

7. In a machine gun mounting for aircraft, the combination of a training member, a gunner's support carried by said training member behind the training axis of the latter, a post the upper end of which carries the gun the rear end of which is restricted in movement only by the connection of the gun to the upper end of the post so that said rear end is free to be moved by hand, a pivotal connection between the lower end of the post and said training member at an axis fixed with respect to the training axis of said member, a support member connected to said post and pivoted at its upper end to said support member, means for pivotally connecting the lower end of said support member to said slidable member, and means for connecting said slidable member to said training member in different positions corresponding to the different angular positions to be given to the post.
the combination of a training member, a gunner's support carried by said training member behind the training axis of the latter, a post the upper end of which carries the gun and the lower end is pivotally connected to said training member at a point some distance in front of the training axis of said member, a stay member disposed behind the post and pivoted at its upper end to said post, a slidable member carried by said training member, means for pivotally connecting the lower end of said stay member to said slidable member, means for connecting said slidable member to said training member in different angular positions to be given to the post, the different angular positions corresponding to the different angular positions to be given to the post, a training mechanism including chain and sprocket gearing, one of the sprockets being mounted co-axially with respect to the pivot connecting the training member, and a hand operated device for driving said gearing.

9. In a machine gun mounting for aircraft, the combination of a training member, a gunner's support carried by said training member behind the training axis of the latter, a post the upper end of which carries the gun and the lower end is pivotally connected to said training member at a point some distance in front of the training axis of said member, a stay member disposed behind the post and pivoted at its upper end to said post, a slidable member carried by said training member, means for pivotally connecting the lower end of said stay member to said slidable member, means for connecting said slidable member to said training member in different angular positions to be given to the post, the different angular positions corresponding to the different angular positions to be given to the post, the gun and the lower end is pivotally connected to said training member at a point some distance in front of the training axis of said member, a stay member disposed behind the post and pivoted at its upper end to said post, a slidable member carried by said training member, means for pivotally connecting the lower end of said stay member to said slidable member, means for connecting said slidable member to said training member in different angular positions to be given to the post, the different angular positions corresponding to the different angular positions to be given to the post, a hollow training pivot connected to said training member, a spring controlled locking bolt carried by a part rotating with said hollow training pivot, said bolt being disposed in a fixed part so as to be lock said training member in its adjusted position of training, an operating lever rotating with said training member, and a cable which passes through said hollow training pivot and which serves to transmit motion from said lever to said bolt for withdrawing said bolt from its hole when required.

11. In a machine gun mounting for aircraft, the combination of a training member, a gunner's support carried by said training member behind the training axis of the latter, a post the upper end of which carries the gun and the lower end is pivotally connected to said training member at a point some distance in front of the training axis of said member, a stay member disposed behind the post and pivoted at its upper end to said post, a slidable member carried by said training member, means for pivotally connecting the lower end of said stay member to said slidable member, means for connecting said slidable member to said training member in different angular positions to be given to the post, the different angular positions corresponding to the different angular positions to be given to the post, a training pivot connected to the training member, a crank on the lower end of said training pivot, and a spring controlled wind balancing device operated by said crank.

12. In a machine gun mounting for aircraft, the combination of a training member, a post the upper end of which carries the gun and the lower end is pivotally connected to said training member at a point some distance from the training axis of said member, training mechanism including chain and sprocket gearing, one of the sprockets being mounted co-axially with respect to the pivot connecting the post to the training member, a hand operated device for driving said gearing, a training pivot connected to the training member, a crank on the lower end of said training pivot, and a spring controlled wind balancing device operated by said crank.

13. In a machine gun mounting for aircraft, the combination with the elements claimed in claim 7 of a training mechanism including chain and sprocket gearing, one of the sprockets being mounted co-axially with respect to the pivot connecting the post to the training member, and a hand operated device for driving said gearing.

14. In a machine gun mounting for aircraft the combination with the elements claimed in claim 7 of means for connecting the gun to said post so that the gun can be elevated and depressed about a transverse horizontal axis, trained about a substantially vertical axis and tilted from side to side about a longitudinal axis at right angles to said substantially vertical axis.

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