

July 1, 1952

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2,601,807

PARALLELOGRAM MOUNTING FOR GUNS

Filed March 12, 1942

2 SHEETS—SHEET 1

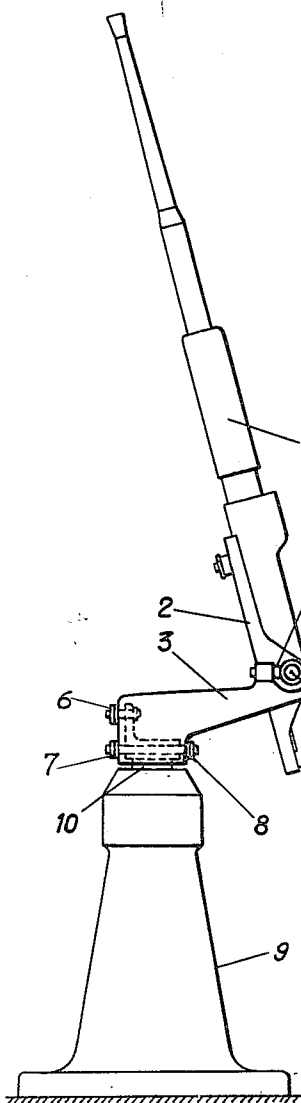


Fig. 1

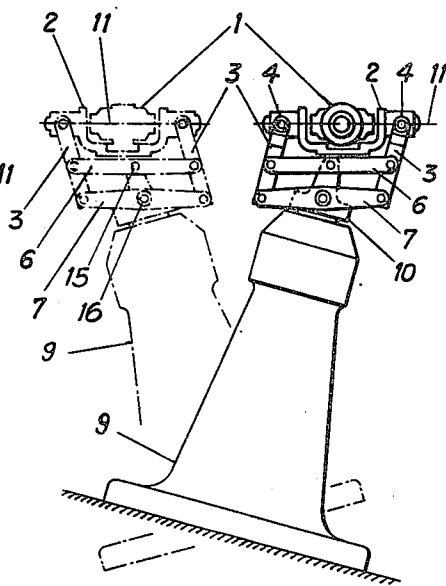


Fig. 2

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2 SHEETS—SHEET 2

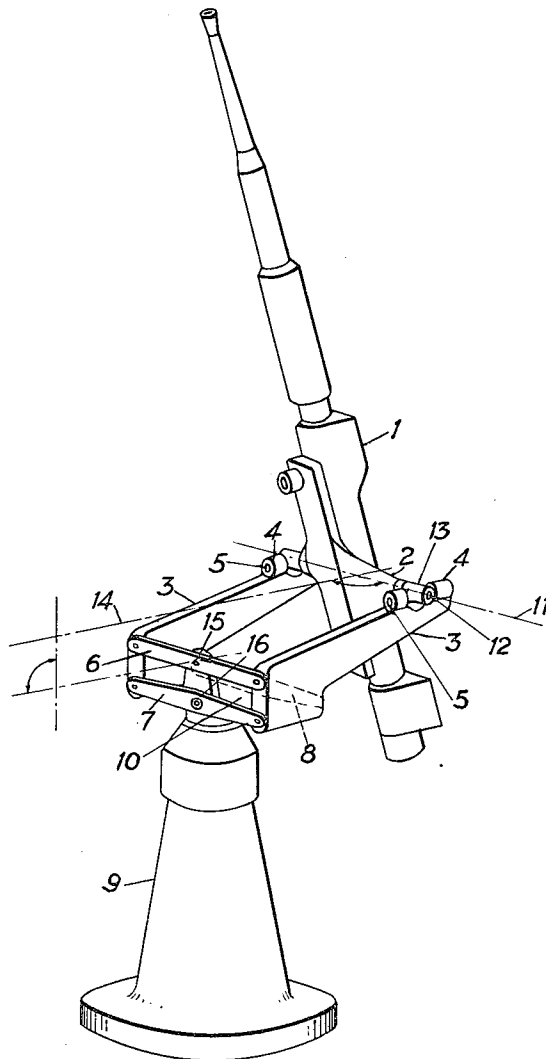


Fig. 3

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UNITED STATES PATENT OFFICE

2,601,807

PARALLELOGRAM MOUNTING FOR GUNS

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Application March 12, 1942, Serial No. 434,400
In Switzerland February 14, 1941

Section 1, Public Law 690, August 8, 1946
Patent expires February 14, 1961

6 Claims. (Cl. 89—37)

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In addition to their elevational and lateral deflection movements, firearms which are mounted on sea-going vessels, and are aimed by the gunners themselves, must be adapted to carry out a third movement in order to compensate for angular variations arising from the movement of the ship. It is impossible otherwise for the gunners operating the weapon to keep the weapon trained accurately on the target.

This compensating movement varies considerably according to the motion of the sea and may, for example, be in the longitudinal axis of the ship or athwart ships. The mechanism for carrying out the above mentioned third movement must naturally neither obstruct nor limit the elevation or lateral deflection movements.

The mechanism for mounting firearms on ships according to the present invention solves this problem in that the weapon is mounted on a link parallelogram support, whereby the weapon can be deflected about an axis perpendicular to the axis about which the elevation of the weapon takes place.

The mechanism whereby the weapon can be elevated and depressed can itself form one side of the link parallelogram. For this purpose, the mounting on which the weapon is supported so that it can carry out the elevational movement can be arranged on two arms which are hingedly connected together by at least two links and are turnably mounted on the member on which the weapon is mounted for lateral deflection movement. The links can be connected centrally, for example, by means of bolts on which they are turnable, with the support by which the weapon is deflected laterally and which generally takes the form of a turnable pillar. The weapon can be suitably arranged in the middle of the link parallelogram and, on constructional grounds, it can further advantageously have its greater links turnably arranged on the said support.

Reference is made to the accompanying drawing, whereon there is shown one constructional form of the invention, by way of example, and whereon:

Fig. 1 is a side view of a weapon mounted on a pillar and pedestal;

Fig. 2 is a view at right angles to that of Fig. 1 and shows the same weapon in the two maximum deflection positions; and

Fig. 3 is a perspective view of the weapon and its mounting.

Referring to the drawings:

The weapon 1 is fixed in a cradle 2, which is

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turnably mounted in arms 3 for carrying out the elevating movement, the arms being arranged on opposite sides of the pedestal. The cradle 2 is also supported by bearings 4 and trunnions 5 in the arms 3. The latter are connected together by links 6, 7 and 8, each pivotally fixed at its centre, as by the pins or bolts 15 and 16 on which the links 6 and 7 are mounted, to a pillar 10 turnably mounted in a pedestal 9 in order that the weapon can carry out its lateral deflection, the pedestal being fixed to the ship.

The combination of the links 6, 7 and 8 with the arms 3 and the combination of the links with the pillar 10 provide a kind of flexible construction, whereby the weapon 1 and its cradle 2 can be tilted on the link parallelogram structure formed by the arms 3 and the links.

If the position of the pedestal 9 is altered, for example, as shown in Fig. 2, the common axis 11 of the pivots 12 positioned in bearings 13 about which pivots the gun elevation is adjusted, can be steadily held horizontal independently of the particular elevation and lateral deflection of the weapon. The links 6, 7 and 8 and the arms 3 together provide a parallel guide which makes it possible for the gunners operating the weapon to compensate for the movement of the ship and the pedestal 9. This is accomplished by tilting the weapon about the horizontal axis 14 which is parallel to the axes about which the links 6 and 7 rotate, and is perpendicular to the axis 11 about which the elevation of the weapon is adjusted. As will be clear from Fig. 3, the cradle 2 rocks on the pivots or trunnions 12 for its elevation adjustment while the horizontal axis 14 extends perpendicularly to the elevational axis 11 running through the pivots 12. About this horizontal axis 14 which, as already stated, runs parallel to the axes about which the arms 6 and 7 rotate, the weapon can be tilted with simultaneous rocking of the linkage structure to make correction for the lateral or rolling movements of the ship.

What I claim and desire to secure by Letters Patent is:

1. Apparatus for mounting firearms on ships comprising a pedestal, a pillar disposed on the pedestal and supporting the firearm for lateral adjustment, a cradle for the firearm tiltable for adjusting the elevation of the firearm, a link parallelogram structure pivotally secured to the pillar, trunnions extending from said cradle, bearings for said trunnions which in turn are pivotally mounted in bearings disposed on said link parallelogram structure, whereby the firearm can be tilted about an axis which is perpen-

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dicular to the axis of elevation and is located in a plane parallel to the support of the firearm.

2. Apparatus according to claim 1, wherein the link parallelogram is composed of two arms on which the cradle is disposed and of at least two links articulated to said arms and pivotally mounted on the pillar.

3. Apparatus according to claim 1, wherein the link parallelogram is composed of two arms on which the cradle is disposed and of at least two links articulated to said arms and pivotally mounted on the pillar, the cradle and its trunnions on which its elevation is adjusted forming a third parallelogram link parallel to the links pivoted on the pillar.

4. Apparatus according to claim 1, wherein the links mounted on the pillar are pivoted thereon at their centers.

5. Apparatus for mounting firearms upon ships for compensating for the tilting movements of the ship, comprising a pedestal, a pillar journaled in the pedestal and rotatable about its longitudinal axis, a pair of parallel links of equal length pivotally mounted at their centers on said pillar, a pair of arms extending at right angles to the plane of the links and pivotally secured to the ends of the links, and a cradle for the firearm positioned between the arms and having trunnions secured in bearings which in turn are provided with trunnions at right angles to the first-mentioned trunnions and journaled on said arms in spaced relation to the pillar, whereby the weapon is adjustable in the vertical plane by rotation of the cradle on its own trunnions and can be held against lateral deflection in response to rolling of the ship by pivotal adjustment of the parallelogram structure formed by the parallel links and the trunnions of the cradle.

6. Apparatus for mounting firearms upon ships for compensating for the tilting movements of the ship, comprising a pedestal, a pillar journaled in the pedestal and rotatable about its longitudinal axis, a pair of parallel links of equal length pivotally mounted at their centers on said pillar and being arranged one above the

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other, a pair of arms extending at right angles to the plane of the links and pivotally secured to the ends of both links, said arms having extensions at the rear of the pillar, and a third link equal in length to the first-mentioned links and parallel thereto and pivotally connected at its ends to said arms, a cradle for the firearm pivotally mounted at opposite ends thereof on the rear extensions of said arms on horizontal axes parallel to the axes of the pivotal connections of the links and arms, so as to maintain a horizontal position in the tilted positions of the pedestal, and means for supporting the cradle for pivotal movement about a horizontal axis which is at right angles to the first-mentioned horizontal axes.

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