

July 27, 1948.

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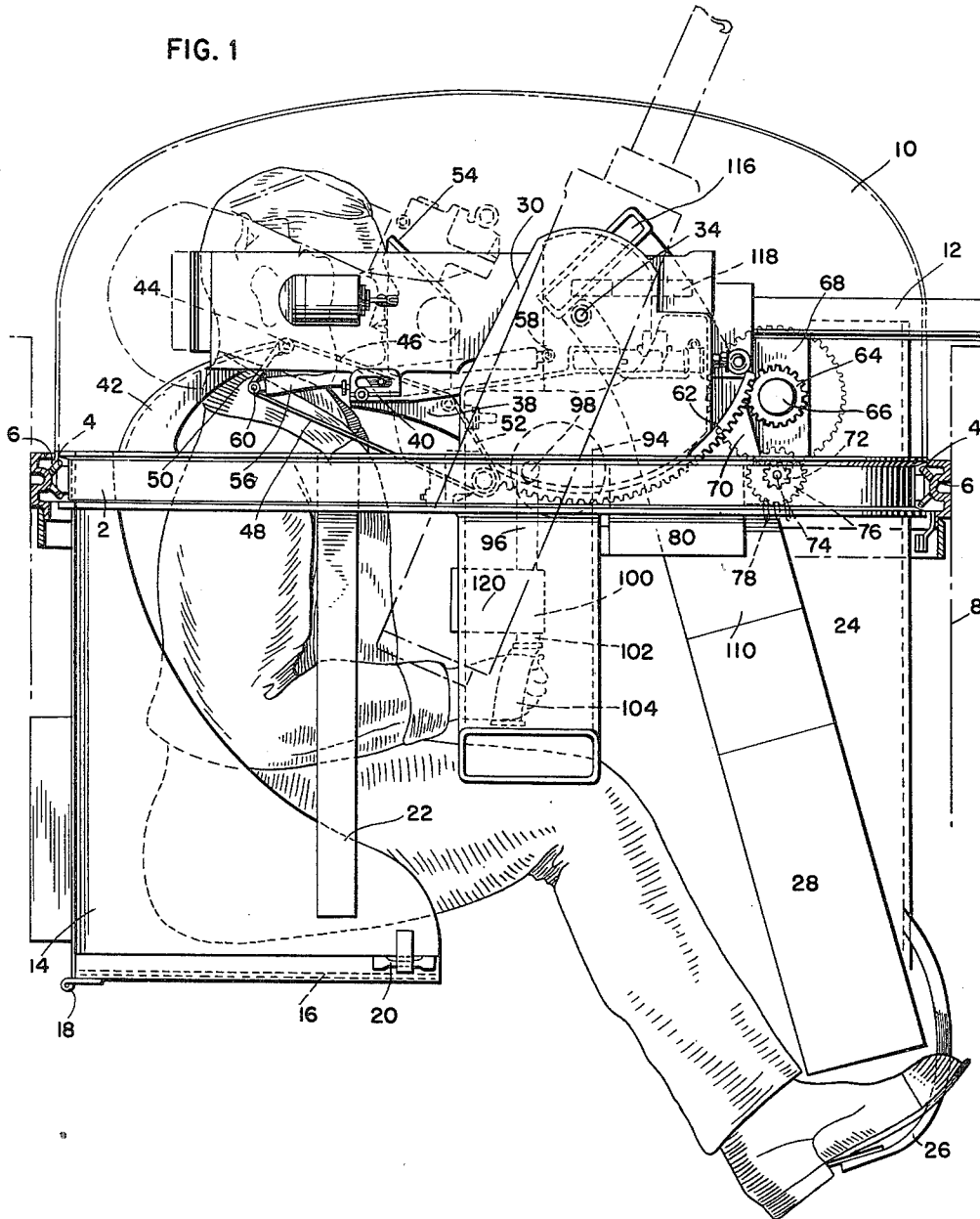
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SPENT AMMUNITION CHUTE FOR GUN TURRETS

Original Filed April 12, 1941

4 Sheets-Sheet 1

FIG. 1



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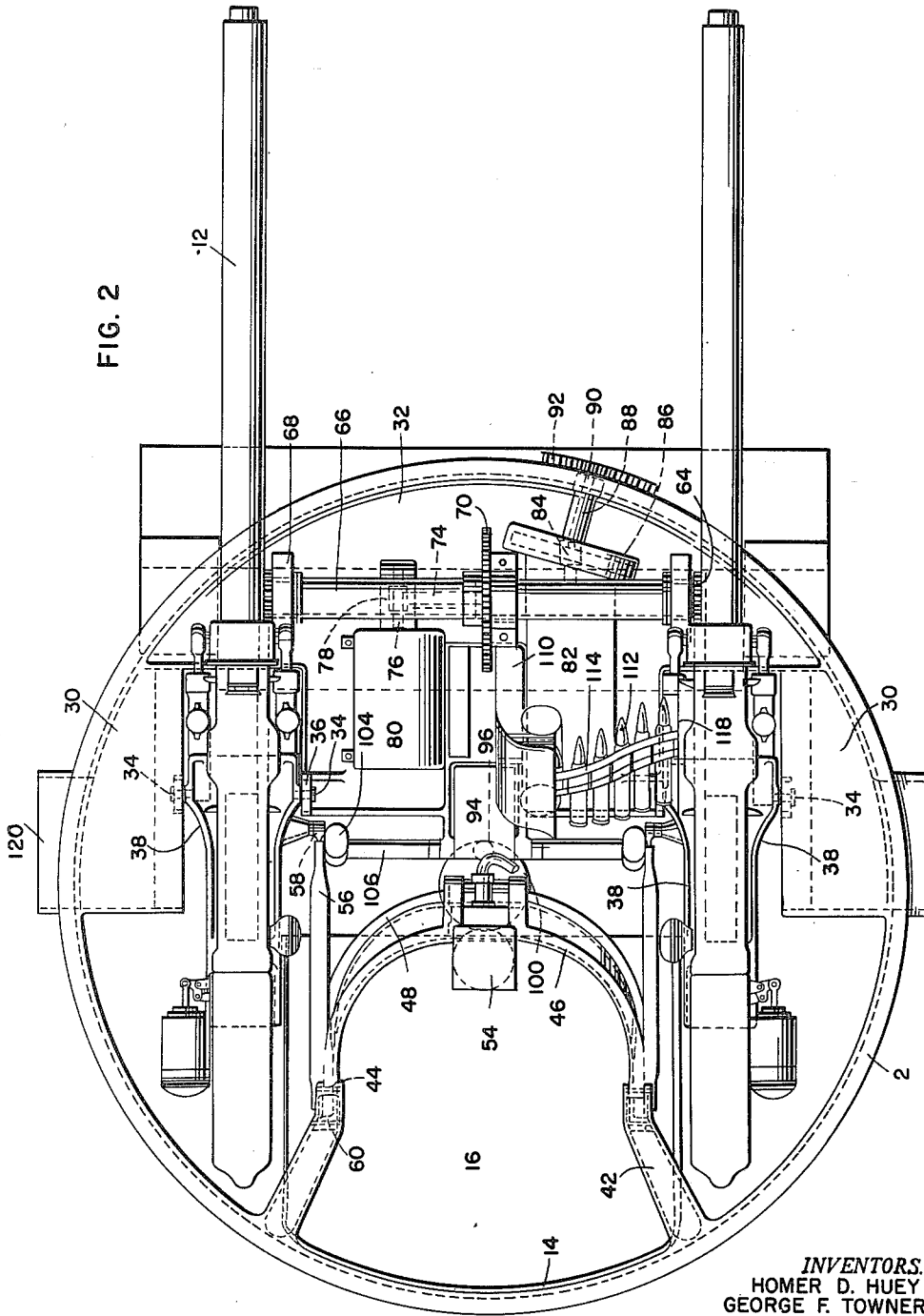


FIG. 2

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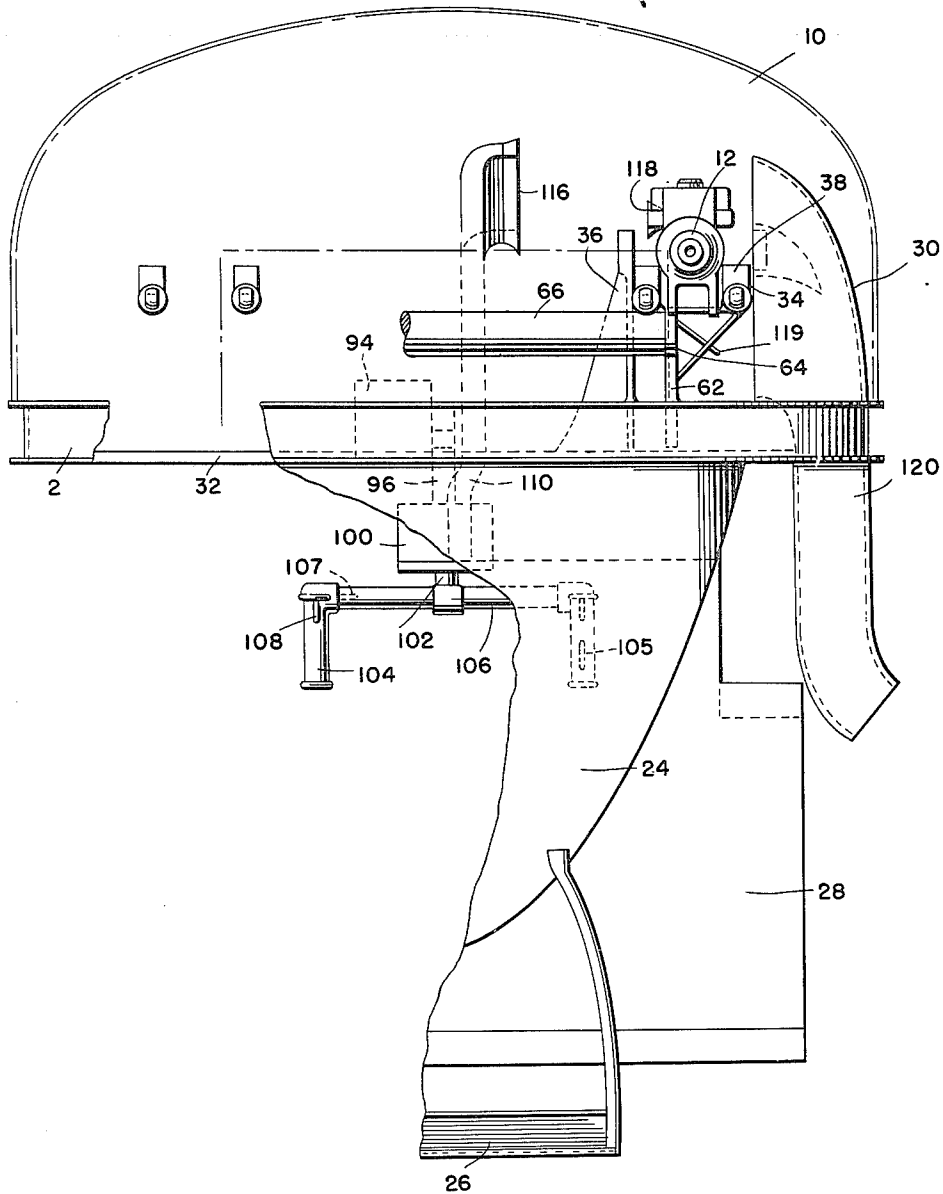
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FIG. 3



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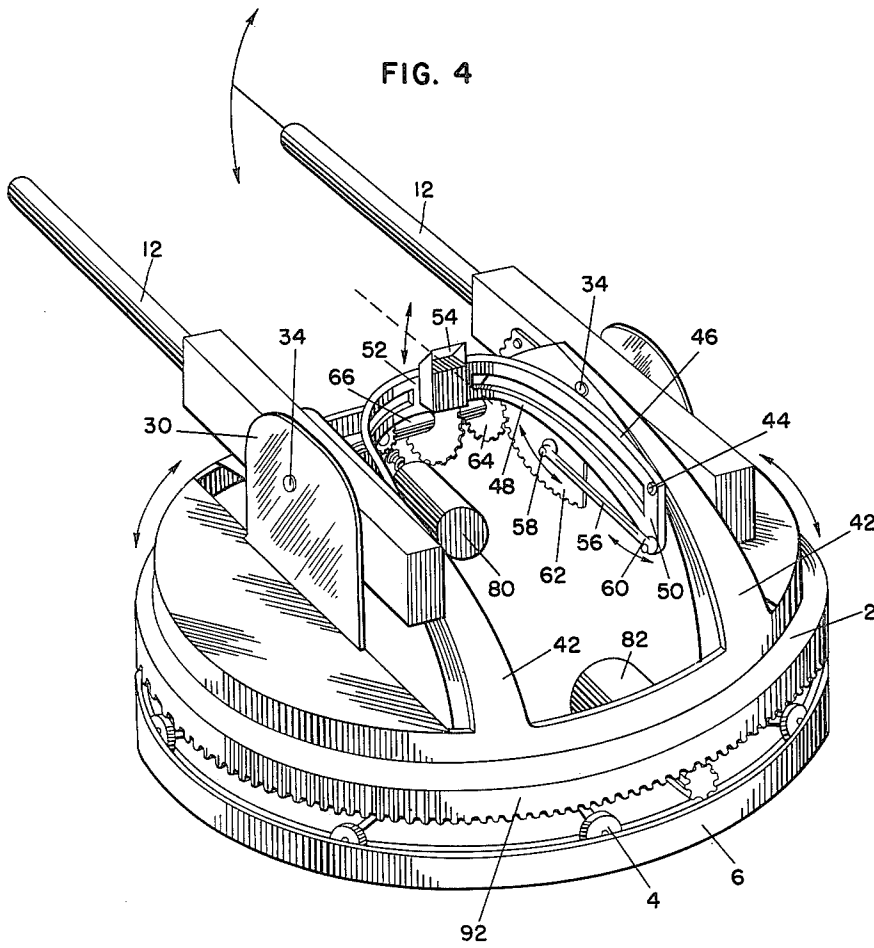
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SPENT AMMUNITION CHUTE FOR GUN TURRETS

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SPENT AMMUNITION CHUTE FOR GUN
TURRETS

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Original application April 12, 1941, Serial No. 388,255. Divided and this application November 30, 1945, Serial No. 631,850

3 Claims. (Cl. 89—33)

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The invention relates to gun turrets, and particularly to power operated turrets.

This application is a division of Serial No. 388,255, filed April 12, 1941.

One object of the invention is to provide a power operated gun turret having two guns and a large ammunition space, which is so arranged as to be very compact and thus to require relatively little space.

Another object of the invention is to provide a gun mounting for a turret which permits movement and aiming of the gun through a very substantial angle without movement either of the turret or of the body of the gunner. More particularly, this part of the invention contemplates the mounting of a sight, and its connection to the gun, in such a manner that it moves about an axis which passes through the neck of a gunner within the turret, so that by merely tilting his head he can follow the sight.

Still another object of the invention is to provide an arrangement which permits the carrying within the turret of a large quantity of ammunition.

An additional object of the invention is to provide, in a turret which turns in azimuth and in which the gun turns in elevation, an ammunition supply carried by the turret and a flexible feed mechanism of simple construction for feeding ammunition from the supply to the guns whatever may be the elevation of the guns.

Still another object of the invention is to produce a simple and effective control for a turret.

Further objects and advantages of the invention will appear more fully from the following description particularly when taken in conjunction with the accompanying drawings which form a part thereof.

In the drawings:

Fig. 1 shows in side elevation a turret embodying the invention;

Fig. 2 is a top plan view thereof;

Fig. 3 is a fragmentary front elevation thereof; and

Fig. 4 is a diagrammatic perspective view, showing the principal elements and their relationship, particularly the mounting of the guns and gun sight.

The turret includes a ring member 2 carrying rollers 4 which run on a track 6 carried by a vehicle 8. The turret body 10 is dome-shaped, and is preferably formed of a transparent material. This dome extends out of the vehicle. It is provided with two parallel slots to permit movement of the guns 12. At one side of the

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turret is a downwardly extending curved sheet 14 of metal, shaped to provide a back and sides for a seat. The seat bottom 16 is hinged at 18 and is held in place by a suitable catch 20. This provides a space by which the gunner can stand in firing position if desired, and also gives an easy means of entrance and exit to and from the turret. The seat is reinforced by tubes 22 of metal extending downward from ring 2.

At the opposite side, the ring 2 has a downward shield portion 24 of armor plate. This supports a foot rest 26 and an ammunition box 28. Upstanding from opposite sides of the ring are ears, supports or frame portions 30, for the guns. A plate 32 extends inwardly from the ring 2 on the side opposite the seat 16.

The guns 12 are mounted on pivots 34 between ears 30 and uprights 35 carried by plate 32. The butts of the guns are arranged on opposite sides of seat 16, so that the gunner actually sits between the guns. Each gun is carried by a frame 38, which engages pivots 34, through a suitable adjusting mechanism 40 so that the elevation and azimuth angles of the gun with respect to the frame can be varied.

Ring 2 also carries two frames 42 extending forward on opposite sides of seat 16. Pivoted at 44 on frames 42 is a U-shaped member comprising top and bottom U-shaped members 46 and 48 respectively, joined together by members 50 and 52 to form a rigid U-shaped frame which supports a standard prismatic gun sight 54. Links 56 are pivoted at 58 and 60 to cause the U-shaped frame carrying the gun sight, to pivot about 44 when the gun is elevated. The points 34, 44, 60 and 58 form a parallelogram so that elevation of the gun produces the same elevation of the sight.

It will be noted that the axis of pivots 44 for the U-shaped frame pass substantially through the neck of a gunner seated on seat 16. Thus the gunner is able, by merely tilting his head, to follow the sight at all times. This of course reduces the space necessary for the operation of the guns.

The guns are elevated by a suitable electrical mechanism. For example, gun frames 38 are provided with rigid gear segments 62. These mesh with gears 64 on a shaft 66 carried on uprights 68 from plate 32. Shaft 66 is driven through gear 70 by a gear 72 on a small shaft 74. Shaft 74 in turn is driven through gear 76 by a worm 78 on the shaft of motor 80, carried by plate 32.

A second motor 82 is provided for rotating the turret. Its shaft carries a gear 84 which meshes

at an angle with gear 86 on shaft 88. A gear 90 on shaft 88 meshes with a rack 92 fixed in the vehicle.

Motor 89 is controlled by a rheostat 94 having a depending operating lever 96 pivoted about a horizontal axis at 98. On this lever is mounted a rheostat 100 for controlling motor 82. The shaft 102 is turnable about a vertical axis to control this rheostat by spaced handles 104 on a cross bar 106. With this arrangement, the gunner can change the guns in azimuth by turning shaft 102, and in elevation by rocking lever 96. Of course, stick triggers 108 are provided on handles 104. Also provided on the left hand handle 104 is a master switch 105 called the dead-man switch, which is operated by the heel of the hand in the same manner as the safety bar on an automatic pistol. If this switch is not closed by pressure of the hand, the turret cannot be operated. Convenient to the thumb of the right hand on cross bar 106 is mounted a high-speed button 107 which, when depressed, multiplies the speed of the turret and gun moving means for both azimuth and elevation.

In the usual machine gun, the magazine which holds the ammunition for the gun is rigid with the gun. This requires either a large structure to hold a great quantity of shells, or frequent changing or reloading of the magazine. Neither of these is practical in a small turret. The present invention therefore utilizes large, fixed ammunition boxes 28, with arrangements for feeding the guns therefrom at varying elevations. These consist of tube 110 of rectangular cross section extending from boxes 28, and serving as guides for cartridges 112 carried by links 114. The mouth 116 of each tube 110 is spaced from the gun at a point opposite the receiving slot 118 in the breech block, and slightly to the rear of the slot. The mouth 116 is arranged so that, at an intermediate position of the gun in its angular movement in elevation, that is, between the solid line and broken line positions in Fig. 1, slot 118 and mouth 116 are parallel. In other words, mouth 116 forms an angle with slot 118 which is always less than the possible angular movement of the gun, and preferably does not exceed about half of such possible movement, being positioned so that a line parallel to its longitudinal axis substantially bisects the angular elevation range. Because of the space between mouth 116 and slot 118, the belt can twist to a degree sufficient to permit proper feeding to the gun at all times.

Ears 30 are shaped to provide discharge channels for the guns. These ears are hollow, and have openings in their inner walls opposite the ejector to receive spent cartridge cases and links. Inasmuch as ejected cases are discharged from the bottom of the gun, a chute 119 is built into frame 33 which changes the direction of travel of the ejected cases so that the cases then travel toward ears 30. With the interior of these ears, the discharge spouts 120 communicate, to conduct the cases and links to a point of discharge.

While we have described herein one embodiment of our invention, we wish it to be understood that we do not intend to limit ourselves thereby except within the scope of the appended claims.

We claim as our invention:

1. A gun turret comprising a ring member mounted to turn about an axis normal to the plane of said ring member, said ring member constituting the sole mounting means for the turret in a vehicle, a pair of spaced parallel guns pivotally secured to said ring member for turning in

elevation with respect to said ring member about an axis above the plane of said ring member transverse to said first mentioned axis, ammunition boxes secured to and depending from said ring member, a rectangular ammunition chute mounted on said ring member extending from one of said ammunition boxes to a point adjacent but spaced from the breech of one of said guns to conduct belts of ammunition from the box to said gun, the end of said chute being so positioned with respect to said gun mount that a line parallel to the longitudinal axis of the mount of said chute, and intersecting the pivotal axis of said guns, substantially bisects the angular movement of the gun about the second said axis.

2. A gun turret for a vehicle mounted for turning about a substantially vertical axis comprising an annular supporting member secured in said vehicle, an annular turret member constituting the sole mounting means for the turret in said vehicle mounted for turning in said annular supporting member, a pair of spaced parallel guns secured to said annular turret member, mounting means extending above said annular turret member to pivotally support said guns about an axis transverse to said first mentioned axis which includes a hollow duct member secured to said annular turret member, affording a pivotal support on one side of each gun, an ammunition box for each gun depending from and supported by said annular turret member, a rectangular ammunition chute extending from said box to a point adjacent but spaced from the breech of said gun on the opposite side from said hollow member to conduct a belt of ammunition from said box to said gun, the end of said ammunition chute being so arranged that a line parallel with the longitudinal axis of the opening in the end thereof, and intersecting the pivotal axis of said guns, substantially bisects the angular movement of said guns in elevation, said hollow member being located close to the butt end of the gun and having an opening large enough to span the portion of the gun carrying the ejector slot for all positions of the gun in elevation so that ejected cases and links are collected by said hollow member.

3. A gun turret for a vehicle mounted for turning about a substantially vertical axis comprising an annular supporting member secured in said vehicle, an annular turret structural member constituting the sole mounting means for the turret in said vehicle mounted for turning in said annular supporting member, a pair of spaced parallel guns secured to said annular turret member, mounting means extending above said annular turret member to pivotally mount said guns about an axis transverse to said first mentioned axis, said mounting means on one side of said gun comprising a mounting bracket and on the other side of the gun said mounting means comprising a hollow duct member affording a pivotal support for said gun and having a portion with an opening therein, said portion including said opening being in a plane parallel to the side of the gun in which is mounted the ejector slot, said opening in said hollow member being large enough to span said ejector slot for all positions of the gun in elevation so that cases and links pass therethrough, an ammunition box for each gun depending from said annular structural member, a rectangular ammunition chute extending from said box to a point adjacent but spaced from the breech of said gun on the side opposite said hollow member to conduct a belt of ammunition from said box to said gun, the end of said ammunition chute be-

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ing so arranged that a line parallel to the longitudinal axis of the opening in the end thereof and extended through the pivotal axis of said guns substantially bisects the angular movement of said guns in elevation.

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