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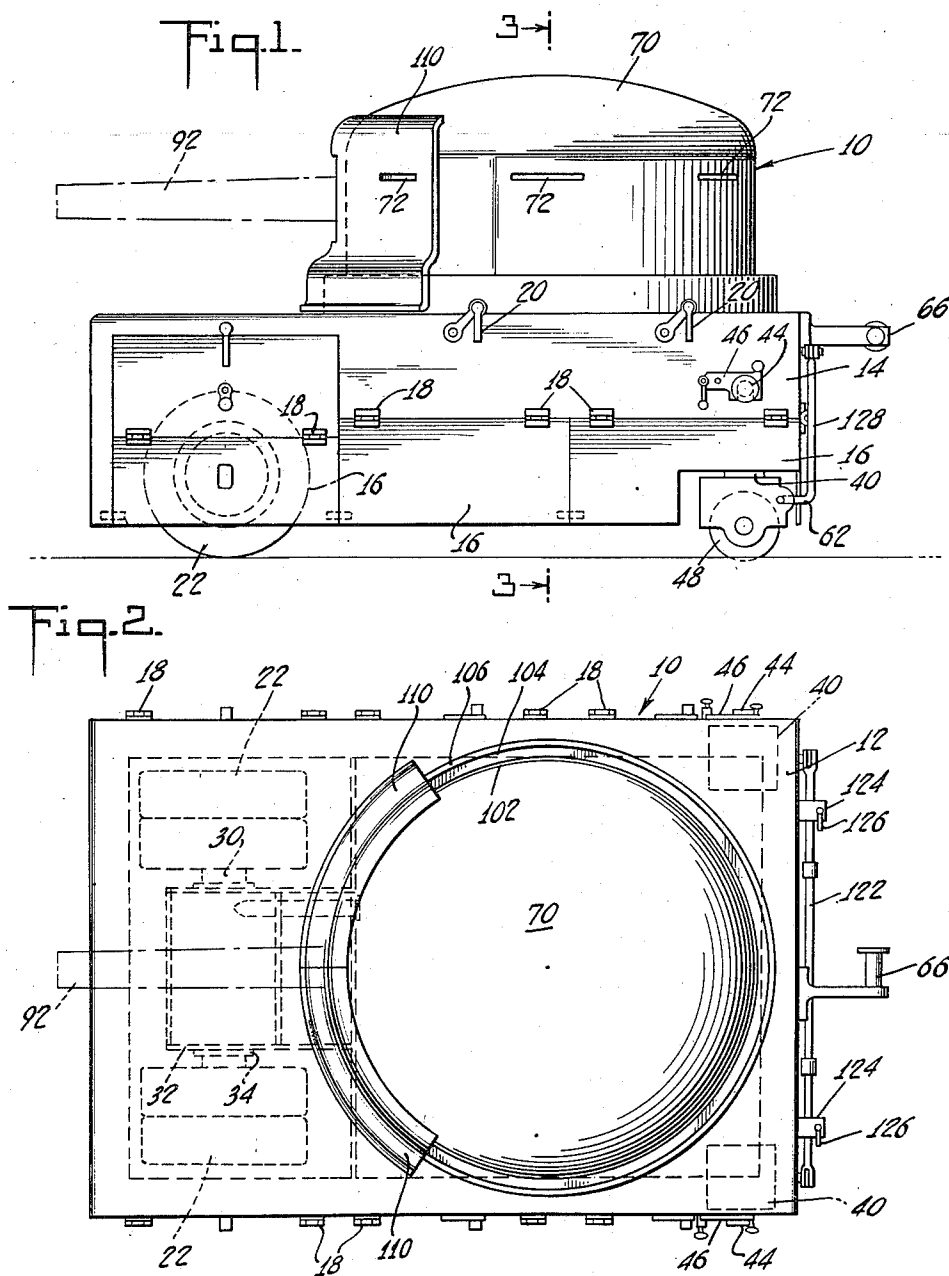
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2,361,570

GUN CARRIAGE

Filed Oct. 31, 1941

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

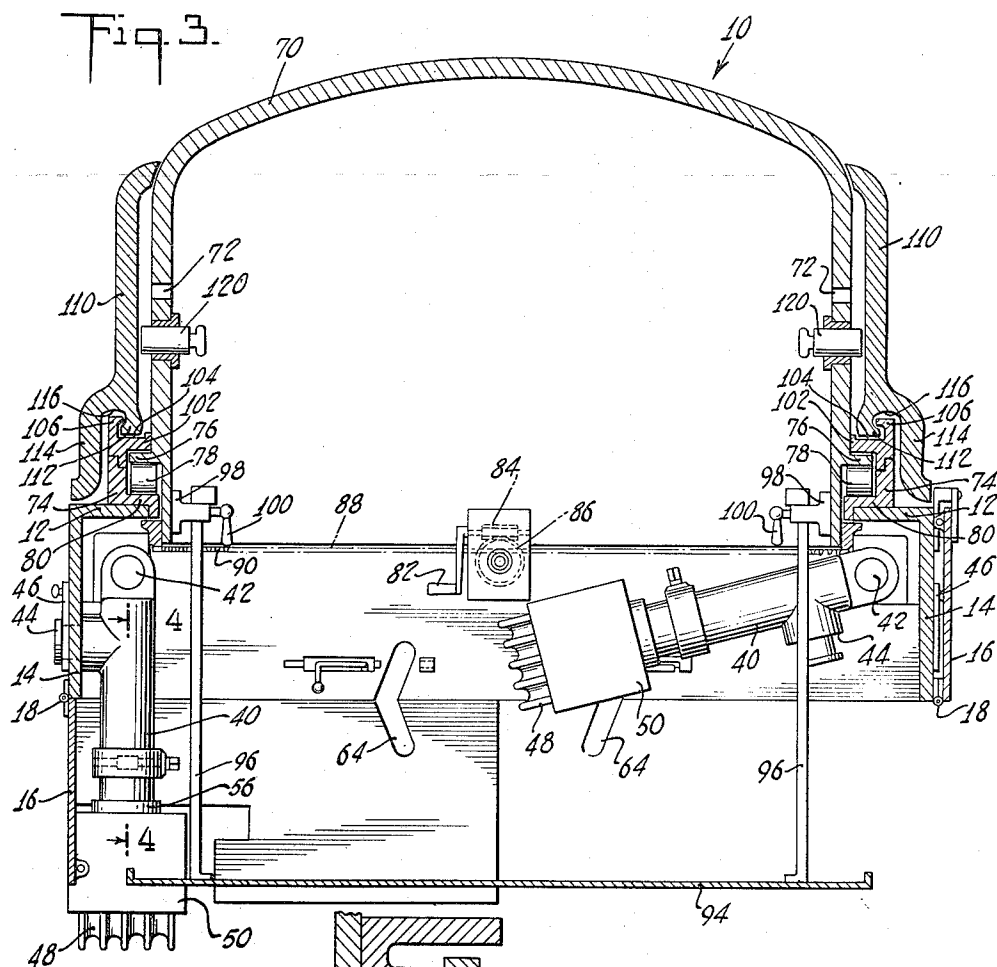
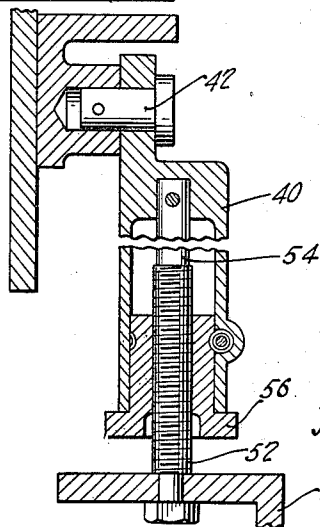


Fig. 4.



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Fig. 5.

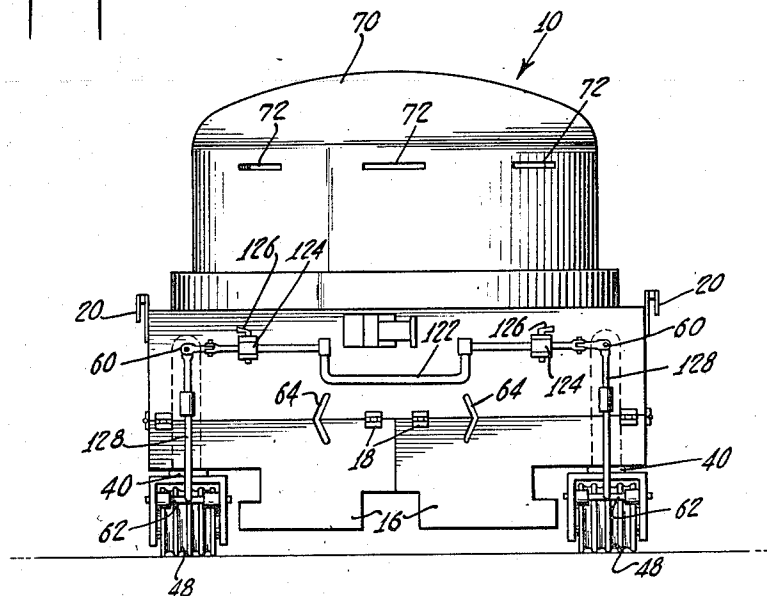
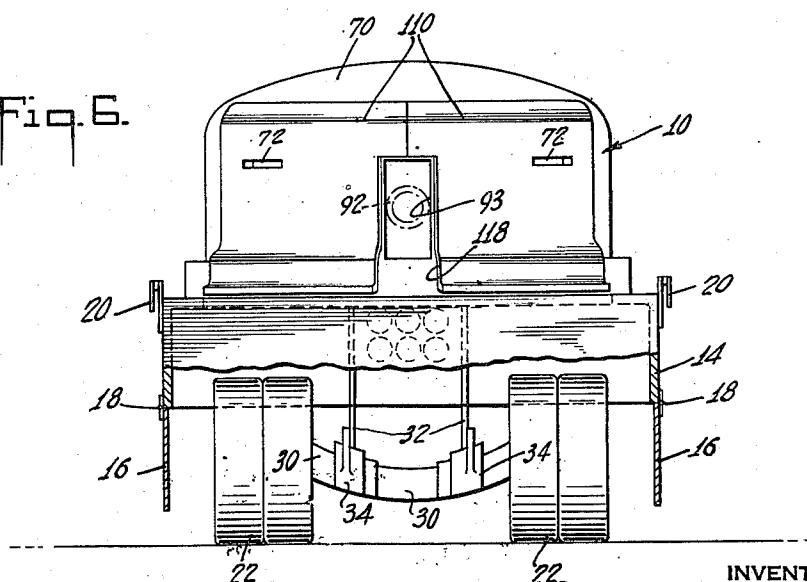


Fig. 6.



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UNITED STATES PATENT OFFICE

2,361,570

GUN CARRIAGE

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Application October 31, 1941, Serial No. 417,260

2 Claims. (Cl. 89—36)

In the course of modern, extremely mobile type of warfare, the intelligent offensive use of armored motor-driven mobile gun carriers, such as tanks, armored cars, and the like, has presented a grave problem to the defense. Conventional field pieces, while having in most instances effective firing power, fail to afford any adequate protection to the gun crew, all too often a fatal handicap in combat against tanks, and their use becomes relatively inefficient. The solution to the problem presented by a tank attack is probably a defense by more heavily armored tanks of perhaps equal or even greater fire power. Tanks, however, are complicated devices, expensive to construct, time consuming in their building, and need the services of one or more trained and expert operators. I have sought to provide a weapon which may, but necessarily need not, be used to combat tanks. My device, while designed for combat from a fixed site, is not self propelled as are tanks, but is mounted for travelling movement by a lorry, tractor or the like. My device is relatively inexpensive, comprising easily fabricated and assembled parts, is easily operable by relatively untrained personnel, and provides adequate protection to the gun crew during combat conditions.

The main object of my invention, therefore, is the provision of an armored enclosure which, while not self propelled, may easily and quickly be moved from one place to another.

Another object of my invention is the provision of a gun platform in an armored enclosure which has a multiple point support so that same may be levelled easily and quickly to provide adequate support for the firing platform.

Another object of my invention is the provision of a gun platform in an armored enclosure, which has a single point support at one end thereof and multiple point support at the other end.

Another object of my invention is the provision of a gun platform in an armored enclosure which has a three point support, at least two of which points are separately adjustable.

Another object of my invention is the provision of a gun platform in an armored enclosure which has support means at one end thereof simultaneously adjustable laterally and vertically.

A further object of my invention is the provision of an armored enclosure having a manually revolvable gun turret.

A further object of my invention is the provision of an armored enclosure comprising a circular dome or turret, and overlying shield mem-

bers therefor, which shields may be shifted laterally about the dome.

A further object of my invention is the provision of an armored enclosure comprising a dome or turret, a gun projecting out therefrom, and shield members to counterbalance the weight of the gun when in one position, the shields being laterally shiftable to provide additional protection for the turret in another position.

A further object of my invention is the provision, in a gun carriage, of a number of bearing rings, one of which supports a dome-like gun turret for rotation about the gun platform, and another of which supports a pair of shield members and the shields are laterally slidable about the turret.

Other and further objects of my invention will be pointed out below, and others will be apparent from the following description of an illustrative embodiment.

My invention is to be limited, not by the disclosure, since it may be departed from without departing from the spirit of my invention, but only by the annexed claims.

In the drawings annexed hereto, forming a part of this specification:

Figure 1 is an elevational view of one form of armored enclosure constructed according to and embodying my invention;

Fig. 2 is a top plan view thereof;

Fig. 3 is a vertical cross section along the line 3—3 of Fig. 1 with the shield members disposed on opposite sides of the turret;

Fig. 4 is a vertical cross section along the line 4—4 of Fig. 3;

Fig. 5 is a front elevational view of the form of device illustrated in Fig. 1; and

Fig. 6 is a rear elevational view thereof.

Referring to the drawings,

In essence, my device consists of a movable carriage on which is mounted an armored dome-like turret or cupola which may be rotated 360° about the horizon, the turret not only serving to support a gun, but also to protect the crew. The gun supporting platform is provided with a multiple point support, and as a special feature, slidable turret overlying shields are provided which not only may be employed to afford greater protection for the gun crew, but also to counterbalance the weight of the gun during rotation of the turret.

The device as a whole is indicated by reference numeral 10 and consists of a metal platform 12 of generally rectangular shape, which may have depending skirt portions 14, 14 of armor plate

pivotaly secured on all four sides thereof. Flaps 16, 16, also of armor plate are provided, hinged at 18, 18 to the lower edges of skirts 14, to overlie the lower portions of the platform, so that the device as a whole can be enclosed, if desired, by an armor plate protective shield. During movement from one site to another, flaps 16 may be swung up and secured back against skirts 14, as by means of suitable hooks 20, to ensure ground clearance during movement.

Platform 12, at the rear thereof, is supported by a pair of wide-tread wheels 22, 22, mounted on axle 30. The connection between the platform 12 and axle 30 is illustrated in Fig. 6. A pair of vertical drop links 32, 32 rigidly secured to the underside of platform 12 and depending therefrom, are provided at their lower ends with inverted U-shaped collars 34, 34 within which axle 30 is slidably received. As shown, axle 30 is curved downwardly and its lowest portion is directly underneath the center of the platform. Normally, links 32, 32 straddle the center of the axle in order to maintain platform 12 level with respect to wheels 22, 22. Collars 34 have a close sliding fit with axle 30, and when wheels 22, 22 are not level, the gun supporting platform 12 may be laterally shifted along axle 30, as by means of a manually operable rack and gear arrangement or other suitable means and as a result, either side may be shifted back and forth along the curvature of axle 30 and thus raised or lowered, as needed, in order to bring the platform 12 to true horizontal level. The suspension of platform 12 on axle 30, despite the pair of supporting wheels 22, 22 and the two straddle legs 32, 32, is the full functional equivalent of a single point suspension with the provision of this curved axle whereby either side of platform 12 may be raised or lowered to bring both sides level.

The other end of platform 12 is supported by a pair of individual mounted legs 40, 40. Each leg 40 is pivotaly secured to platform 12 for transverse swinging movement inside and under platform 12, and vertically downward by pin 42. Legs 40 are of hollow metal construction, and are provided on their outer sides with a channelled head piece 44. Skirt portion 14 depending from the sides of the platform is suitably apertured so that when leg 40 is swung into vertical position, the head piece 44 will extend through the opening in the skirt 14, and a lock bar arrangement 46 is provided on the outside of skirt 14, adjacent the aperture, to engage the channel on the head piece and thus lock the leg in against any removal from the vertical position.

A wide tread wheel 48 may be mounted at the bottom of each leg 40, inside a bearing 50, which is supported by a threaded hollow shaft 52 telescoping with a shaft 54 fixed inside the leg. A helical worm gear nut 56 secured within leg 40, is mounted about shaft 52, so that shaft 52, and wheel 48 can be raised or lowered as desired. As desired, a flat plate having its underside suitably channelled, may be employed instead of wheels 48 on the bottom of the jack legs 40, 40, but while the plates mean better recoil resistance, their use entails loss of the use of the wheels for moving purposes.

A horizontally level firing platform is extremely desirable. A three point support is the minimum required for stability, and I achieve this in my device by the one point rear axle support, and the two individually articulated front jack legs. By means of this arrangement, levelling the gun-supporting platform becomes a rela-

tively simple and expeditious matter. The front jack legs may be raised or lowered individually, and the rear of the platform may be shifted along the bent-axle, or by a suitable manually actuated rack and gear mechanism, or otherwise.

As above stated, rear axle 30 is curved along the arc of a circle, and the gun-supporting platform may be slid laterally along the axle. The purpose of this construction is as follows: when bringing the platform to a horizontal level by adjusting the height of the jack legs, the sliding lateral motion along the curved axle is equivalent to adjustment around a point which is the center of curvature of the axle. In other words, although the gun-supporting platform ultimately is supported by two jack legs and two wheels in the rear so as to have a broad base for stability, it is brought to true level by adjustments of three points of support, two of which are real, and the other one is about a single point. When the levelling is completed, the platform may be solidly locked on the curved axle.

Such horizontal levelling is quite necessary for easing the rotations of the turret when it is rotationally unbalanced by the combined weight of the gun and the shields.

The two front legs 40, 40 may be steered by means of steering rod 122 (see Figs. 2 and 5). Each end of rod 122 is pivotaly connected to a shaft 128, at the level of the rotational axis of legs 40, as at 60 (see Fig. 5). This is essential, in order to permit legs 40, 40 to be swung inside the frame housing. The bottom of each shaft 128 is secured to a yoke member 62, the arms of which encircle the axle on which the wheels 48 are mounted. Posts 128, 128 are also of telescope construction so as to expand and contract in length with the legs 40, 40. Suitable openings 64, 64 are provided to receive the steering posts 128 when same are folded up inwardly. Thus, wheels 48, 48 are provided with steering means which serve also to keep them parallel during turning movement. The steering gear includes, as above, rod 122, shafts 128, 128, yokes 62, 62, and locks 124, 126 are provided to secure rod 122 when folded up against the enclosure.

During travelling movement, legs 40 may be folded inside or alongside the platform, and the device is supported by the rear wheels and by the moving agency, as a tractor or the like, by securing of tongue 66 thereto. Of course, if desired or needed, the front legs 40, 40 may be lowered during travelling movement to help support the platform, and they may be steered by bringing rod 122 down from the platform, pivoting posts 128 out also, and manually directing same.

My armored enclosure, indicated generally by reference numeral 10, comprises a dome-shaped turret 70, formed of armor plate and provided with a plurality of horizontally arranged viewing slits or openings 72, 72, so that the crew within the turret may look out therethrough and command the horizon. Turret 70 is rotatable, and is supported for rotation on a main bearing ring 74 which is mounted atop platform 12, see Fig. 3. Turret 72 is provided with an outwardly extending shelf portion 76 which rests on rollers 78 disposed on the floor 80 of the bearing ring 74. Manually operable turret rotating crank means 82 are provided, operatively connected to pinion 84 and gear 86, actuation of which crank 82 will cause rotation of the turret on the main bearing frame through shafting 88 and gearing 90. Other suitable rotating means may be provided,

but the desideratum is easily manually operable rotating means. More than one gear ratio may be provided, if desired, for faster or finer rotational movement of the turret.

A gun 92 is mounted atop platform 12 turret 70, projecting out therefrom through a suitable opening 93. The gun and its recoil mechanism are mounted inside turret 70 in the conventional manner, and the gun may be elevated or depressed through conventional manually operable crank and gear mechanisms.

A floor 94 is provided within turret 70 for rotation therewith, which platform is suspended from turret 70 by means of shafts or drop links 96, 96. Shafts 96, 96 are slidably secured within vertically apertured encircling collars 98, 98 mounted on the inner walls of turret 70. Suitable crank means as 100 may be provided on each of these collars 98, 98 whereby as desired during movement, the height of floor 94 may be raised above the level of rear axle 30 in order to clear ground obstructions, but during use, the floor may be lowered so that the crew inside the turret can have the viewing openings 72, 72 at eye level.

In addition to the main bearing ring 74, I provide a sub-bearing ring 102 on the turret or the platform, which sub-ring has formed therein an annular groove or trackway 104. Sub-ring 102 also has formed as a part thereof an upwardly projecting outer wall 106 at its outer margin, the purpose of which will be explained below. I provide a pair of shield members 110, 110, also of armor plate material, and mount them for sliding movement on the sub-ring 102. Each shield member 110 has an inside extension 112 which fits into ring trackway 104, and has also an outside extending skirt portion 114 which reaches out and down over the main and sub-bearing rings 74 and 102. The wall portion 112 projecting out and upwardly from sub-ring 102 is received and held captive within the recess 116 formed within each shield member 110 between the extension 112 and the outer extending skirt 114 (see Fig. 3).

Shields 110, 110 are concentric with turret 70, that is, they have approximately the same degree curvature as turret 70 and each shield 110 is preferably about sixty degrees in lengthwise dimension, and substantially as high as turret 12. Shields 110, 110 are preferably not too heavy to be shifted about turret 70 manually, although if desired, suitable mechanism may be provided for such purpose. The shields 110, 110 are notched or cut out as at 118, 118 so that when they are shifted together in front of the opening 93, the gun 92 may project therethrough. Manually operable locks 120, 120 may be provided on the wall of turret 70 either in front of gun 92, or on the

opposite side of turret 12 from gun opening 93, to lock the shields in either position.

The turret 70 and shields 110, 110 are thus seen to be mounted on two bearing frames or rings. The main frame 80 and the sub-frame 102 are shown to be separate members, although they need not be, and they may be mounted together or separately. The turret itself rotates on the main frame, and the shields slide about on the upper sub-frame. As shown in Fig. 3, the extension 76 from turret 70 defines a shelf which rests upon rollers 78.

Shields 110, 110 are an important feature of my invention. During an engagement, when gun 92 is directed towards the enemy, and maximum protection for the crew within the turret is desired, shields 110, 110 may be fixed in front of gun 92, as shown in Fig. 6.

Gun 92 is quite heavy, as are shields 110, 110, and if their total weight were concentrated at any one point of the turret, it would prove to be an extremely difficult matter to manually rotate the turret when the platform has not been levelled. When the enclosure is being shifted from one site to another, it must be ready for any emergency, as a surprise attack from an unexpected quarter. At such times, the gun crew riding within the turret, must be ready to man and operate the gun at an instant's notice. If the weight of the gun and shields were concentrated at one point, it might perhaps require too much time to bring the gun to bear, and the delay might well be fatal. Therefore, during travelling movement, shields 110, 110 are locked on diametrically opposite side of turret 70 from gun 92, in order to balance the weight of the gun and make easier manual rotation of the turret.

Having now described my invention, what I claim and desire to secure by Letters Patent is:

1. A gun carriage comprising a platform, and adjustable means to support same horizontally in spaced relation to the ground, a bearing ring on said platform, a circular dome-like turret revolvably mounted on said ring, a gun disposed within said turret projecting out therefrom, means on the platform to counterbalance the weight of the gun and means to mount the counter-balancing means for concentric movement with respect to the turret, said counter-balancing means being shiftable about the turret independently thereof and in substantially concentric relation thereto.

2. A gun carriage as in claim 1 in which a second bearing ring is provided and the counterbalancing means comprise a plurality of arcuate plates mounted on said second ring for lateral movement about the turret independently of the turret.

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