April 21, 1931. E. C. GOEBERT ET AL 1,801,423

GUN CARRIAGE

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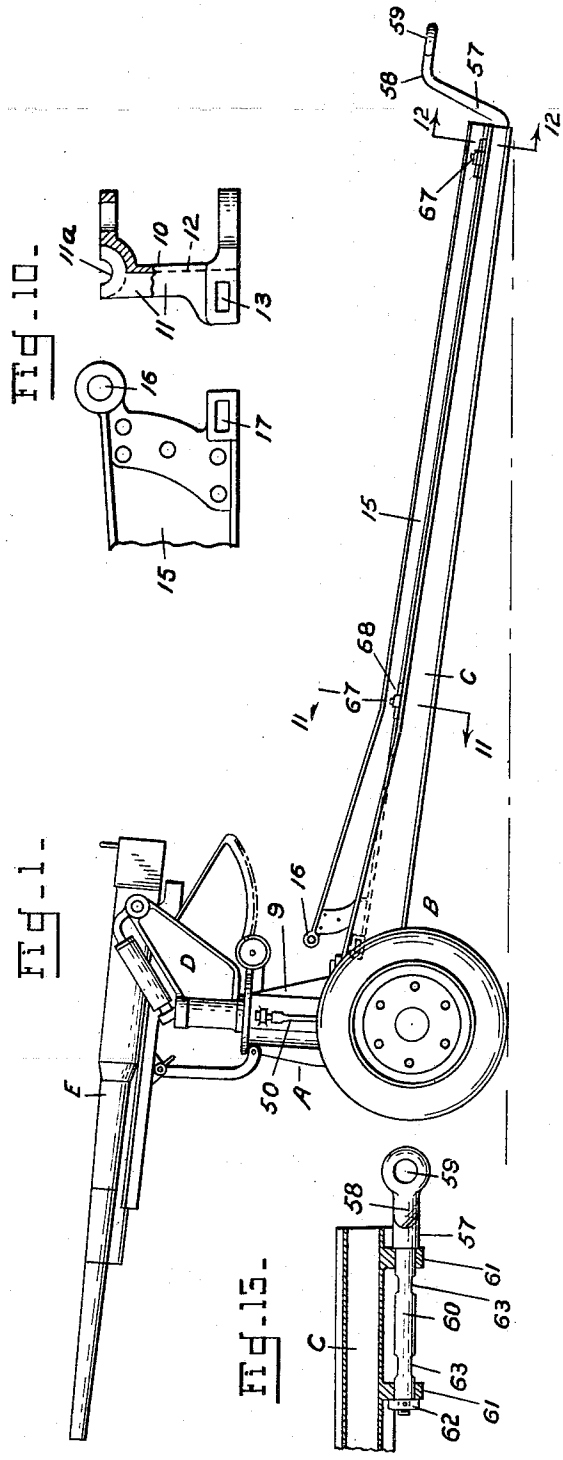


Fig. 1.

Fig. 10.

Fig. 15.

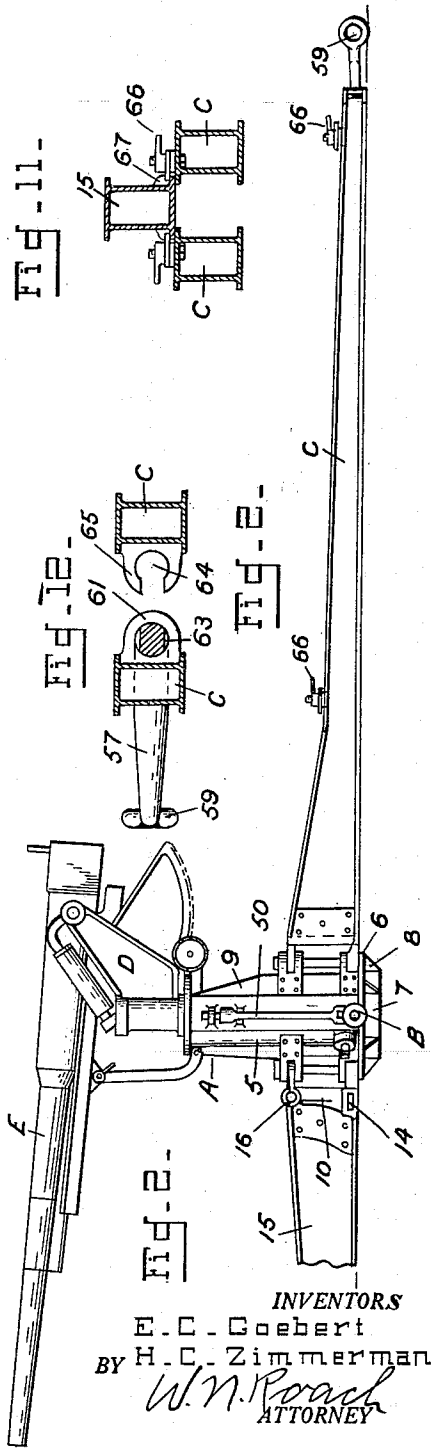


Fig. 2.

Fig. 11.

Fig. 12.

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Fig. 3.

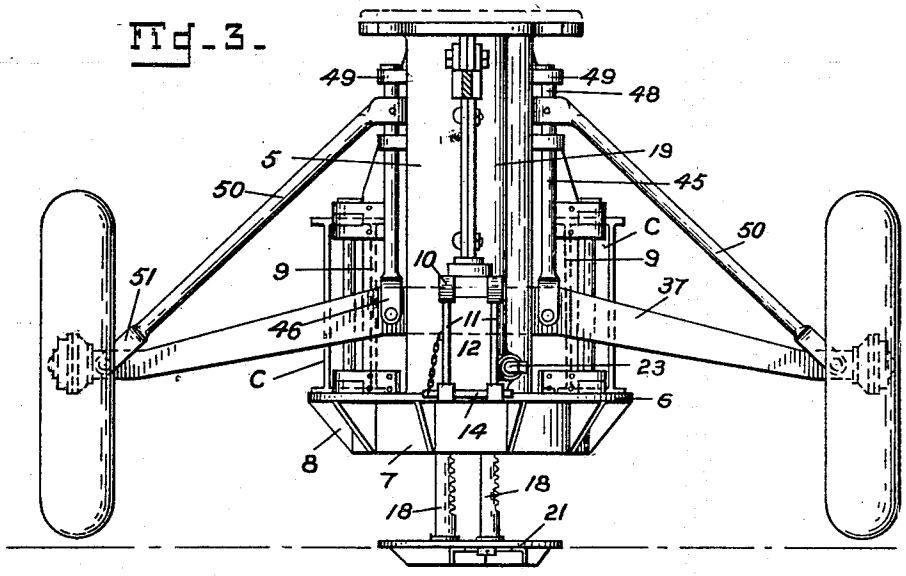
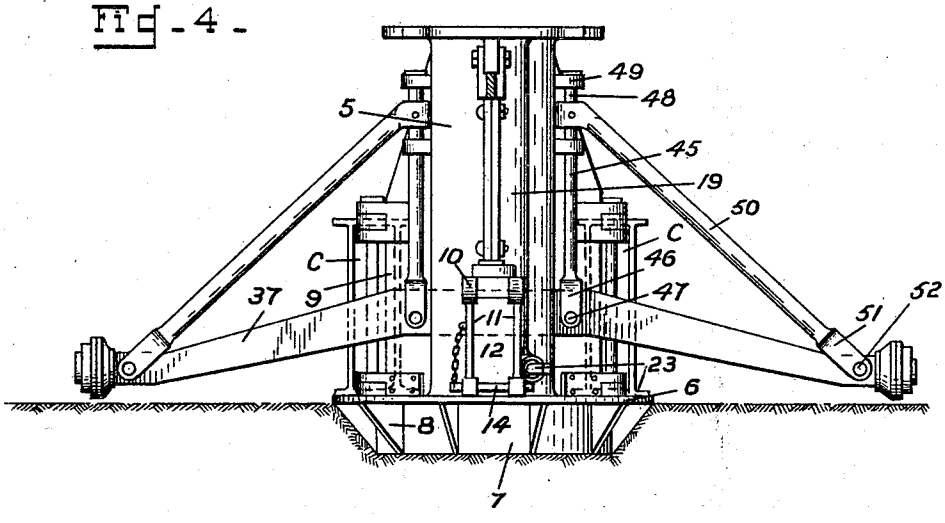


Fig. 4.



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GUN CARRIAGE

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Fig. 5.

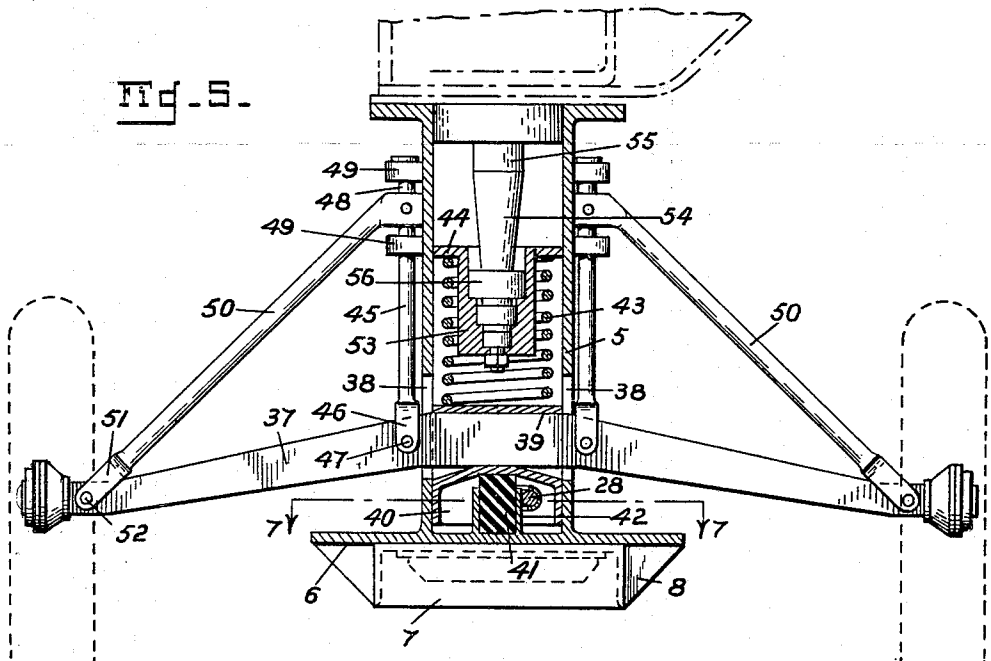
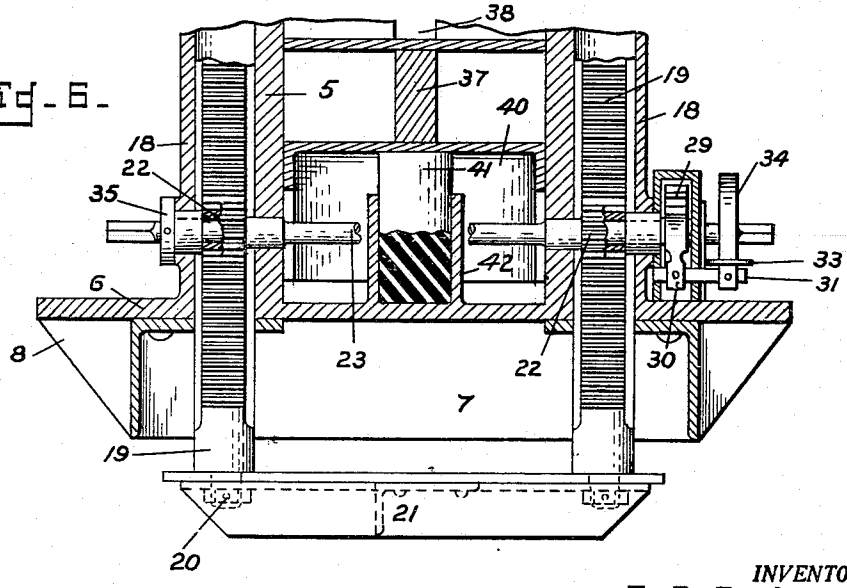


Fig. 6.



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Fig. 7.

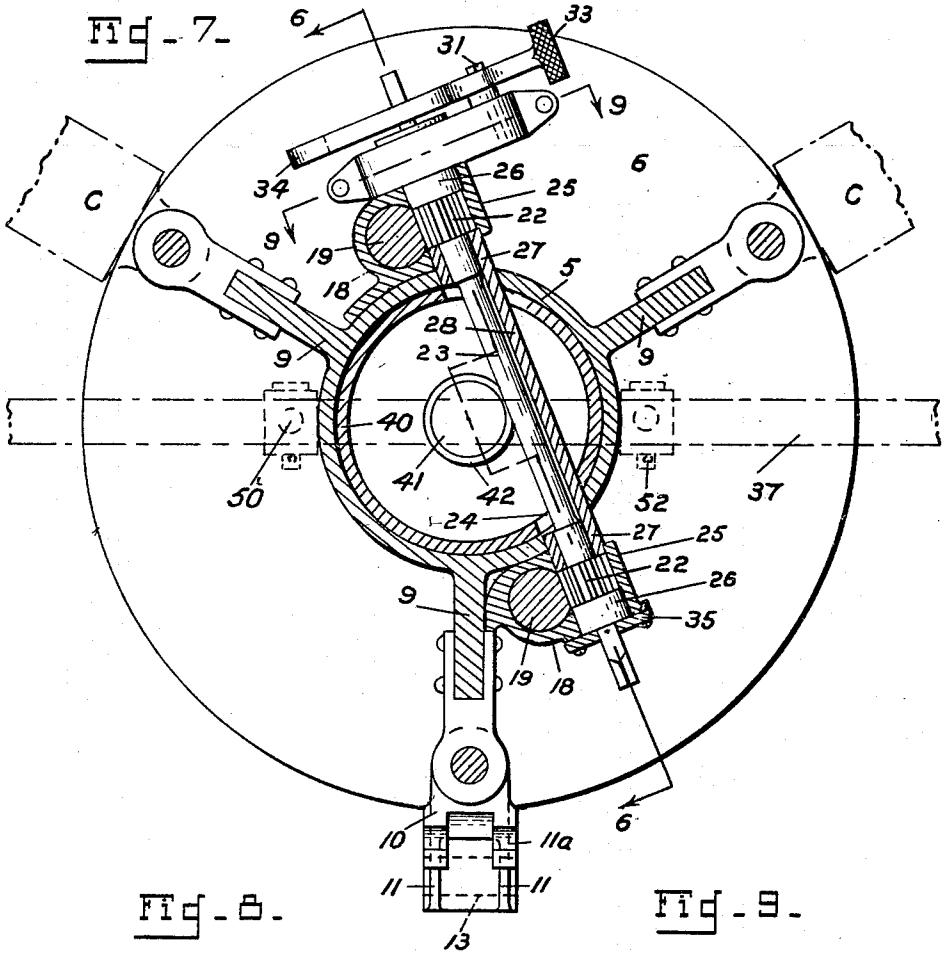


Fig. 8.

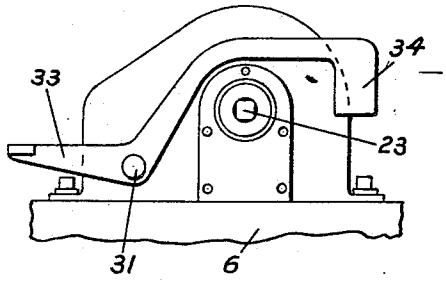
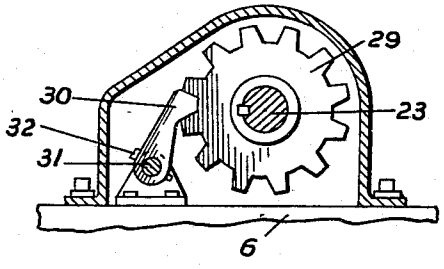


Fig. 9.



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UNITED STATES PATENT OFFICE

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GUN CARRIAGE

Application filed October 1, 1930. Serial No. 485,775.

(GRANTED UNDER THE ACT OF MARCH 3, 1883, AS AMENDED APRIL 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to us of any royalty thereon.

The subject of this invention is a gun carriage.

In establishing a gun defense against aircraft it has been customary to employ special anti-aircraft guns which were not assigned a mission against ground targets. On the other hand the light field artillery employed to cooperate with infantry, and therefore available in relatively larger numbers over a given area requiring protection, has never been assigned to aerial targets because the gun mounts are not structurally capable of sufficient movement in azimuth and elevation and because they do not possess sufficient stability to insure the delivery of a projectile at a particular and accurately calculated point in space.

In designing a gun carriage which is to be essentially a light field artillery weapon but capable of delivering fire against air craft, a compromise must be effected between the characteristic requirements of two types of mounts, the restriction as to weight being constantly in the foreground.

In accordance with a program of this nature it is proposed to associate a wheeled axle unit with a gun mount in such a manner that an elevating and depressing mechanism may be employed to establish ground contact for the gun mount, to raise the wheels from the ground to permit their removal and to lower the gun mount on to the ground.

A yielding suspension is incorporated in the carriage and arranged with a view to obtain simplicity and compactness.

With the foregoing and other objects in view, the invention resides in the novel arrangement and combination of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

A practical embodiment of the invention is illustrated in the accompanying drawings, wherein:

Fig. 1 is a view in side elevation of the improved gun carriage showing the parts in the traveling position;

Fig. 2 is a view in side elevation of the gun mount emplaced for firing;

Fig. 3 is a view in front elevation showing the mount emplaced for emergency firing;

Fig. 4 is a view in front elevation showing the mount lowered onto the ground;

Fig. 5 is a transverse sectional view through the mount;

Fig. 6 is a vertical sectional view on the line 6—6 of Fig. 7 and showing the elevating and depressing mechanism;

Fig. 7 is a sectional view on the line 7—7 of Fig. 5;

Fig. 8 is a view in side elevation of the pinion shaft and foot lever;

Fig. 9 is a sectional view on the line 9—9 of Fig. 7;

Fig. 10 is a detail view in side elevation, parts in section, showing the adjoining ends of the outrigger and mount;

Figs. 11 and 12 are sectional views on the corresponding lines of Fig. 1; and

Fig. 13 is a horizontal sectional view through the trail lock.

Referring to the drawings by numerals of reference:

There is shown in Figs. 1 and 2 a gun carriage consisting generally of a pedestal mount A, supported by a wheeled axle unit B and trail members C. A top carriage D of typical anti-aircraft design carries a gun E.

The mount A (Fig. 3) comprises a cylindrical pedestal 5 having an enlarged base 6 including an annular spade 7 for engaging the ground. A plurality of radially disposed triangular webs 8 connect the spade to

the marginal portion of the base and provide an increased anchorage when the mount is emplaced.

On the upper side of the base a plurality of equally spaced webs 9 (Fig. 7) preferably three in number, connect the base and the pedestal 5. Two of the webs are employed to hingedly carry the trail members C while the remaining web hingedly carries a socket member 10 (Figs. 4 and 10) consisting of spaced vertical side plates 11 and a back plate 12. The upper extremities of the side plates are each formed with an open bearing 11*a* and the lower extremities are provided with aligned apertures 13—13 for receiving a pin 14. An outrigger 15 having one end arranged to fit in the socket member 10 includes journal pins 16—16 receivable in the open bearings and an aperture 17 for receiving the pin 14.

A pair of tubular housings 18—18 (Fig. 7) fixed to the pedestal on opposite sides thereof each encloses a rack-bar 19 of an elevating and depressing mechanism. The rack-bars extend through the base and are each secured as by a pin 20 to a foot plate 21 (Fig. 6). Meshing with the rack-bars are a pair of pinions 22—22 fast on a shaft 23 extending through the pedestal 5 which is conformably provided with apertures 24—24. The pinions are disposed in an extension 25 (Fig. 7) of the housing 18 and the terminal portions of the shaft are mounted in outer bearings 26—26 and in inner bearings 27—27, the latter connected by a semi-cylindrical spacer 28 which holds the bearings in place.

Referring to Fig. 9 one end of the shaft 23 carries a ratchet wheel 29 engaged by a pawl 30 secured to a shaft 31 by a pin 32. A foot lever 33 is secured to the projecting end of the shaft 31 and includes a weighted arm 34 for normally maintaining the pawl in engagement with the ratchet wheel.

The ratchet wheel on one end of the shaft, and a collar 35 on the other end holds the shaft against displacement and maintain the pinions in proper engagement with the rack-bars. The extremities of the shaft are squared for the reception of an actuating tool.

As seen in Figs. 1, 3 and 5, the gun mount is adapted for transportation by means of a carriage consisting of a single wheeled axle unit. The bowed axle 37 passes through aligned apertures 38—38 in the pedestal 5 and the central portion of the axle is received in an aperture 39 in a saddle 40. The saddle is cylindrical and has a sliding fit in the pedestal, and rests on a resilient member 41, specifically a block of rubber, whose lower portion is disposed in a rigid container 42 secured to the base.

A yielding suspension is provided through a helical spring 43 which is confined between the upper face of the saddle 40 and a diaphragm 44 in the pedestal. The relative movement of the pedestal with respect to the axle is only limited by the strength of the spring.

For the purpose of maintaining the assembled relationship between the pedestal and axle and preventing independent transverse and longitudinal movement of the members a truss is provided on each side of the pedestal. Each truss includes a vertical rod 45 whose lower bifurcated end 46 embraces and is secured to the axle by means of the pin 47 and whose upper end 48 is inserted through a pair of spaced eyes 49—49 fixed to the pedestal and maintaining the rod parallel to the pedestal. An inclined rod 50 is secured to the rod 45 between the spaced eyes 49 and has a lower bifurcated end 51 secured to the axle by means of a pin 52.

As shown in Fig. 5 the diaphragm 44 includes a depending tubular extension 53 which not only serves as a guide for the spring 43 but receives the lower end 54 of the spindle 55 of the top carriage 6 and also the bearings 56 for the spindle.

In the traveling position the trail members are folded and locked together by a draft coupling 57, (Figs. 12 and 13) bent twice at a right angle. The outer free arm 58 terminates in a lunette 59 and the inner arm 60 is mounted in spaced bearings 61—61 fixed on the inside of one of the trail members and held against removal by a nut 62. The inner arm is formed with a pair of flattened portions 63—63 adapted to enter a key hole slot 64 formed in lugs 65 on the inside of the other trail member. Rotation of the coupling 57 through 90° and to a vertical position turns the flattened portions in the key hole slot and locks the trail members together.

The trail members are provided on the upper sides with a plurality of clamps 66 for engaging lugs 67 on the outrigger when the outrigger is laid on the folded trail members. This is the traveling position of the gun carriage.

In emplacing the mount the shaft 23 is actuated to lower the rack bars until the foot plate engages the ground (Fig. 2). Continued actuation causes the pedestal and axle unit to be raised and from this position the gun may be fired or the wheel may be removed. Reversal of the shaft 23 either by action thereon through wrenches or by weight of the mount when the pawl is disengaged from the ratchet wheel, causes the pedestal to be lowered onto the ground. The trail members are opened out and when the outrigger is attached to the socket member, an enlarged base resting on the ground is provided to insure stability during firing. The mount is prepared for the traveling by reversing the foregoing procedure.

We claim:—

1. In a gun mount, a pedestal having an enlarged base, an annular spade on the base, spaced rack-bars carried by the pedestal, a shaft passing through the pedestal, pinions on the shaft meshing with the rack-bars, a ratchet mechanism for the shaft, a foot-plate disposed within the annular spade and connected to the rack-bars, a saddle within the pedestal, a cushioning member between the saddle and the base of the pedestal, a spring between the saddle and the upper portion of the pedestal, an axle passing through the pedestal and saddle, vertically disposed rods secured to the axle on opposite sides of the pedestal, spaced guides on the pedestal in which the vertical rods are movable, an inclined rod secured to the axle and to a vertical rod between the spaced guides, wheels detachably secured to the axle, trail members hinged to the pedestal, an outrigger attachable to the pedestal, and a top carriage mounted in the pedestal and depending within the spring.

2. In a gun mount, a pedestal having an enlarged base, an annular spade on the base, spaced rack-bars carried by the pedestal, a shaft passing through the pedestal, pinions on the shaft meshing with the rack-bars, a foot-plate disposed within the annular spade and connected to the rack-bars, a saddle within the pedestal, a cushioning member between the saddle and the base of the pedestal, a spring between the saddle and the upper portion of the pedestal, an axle passing through the pedestal and saddle, vertically disposed rods secured to the axle on opposite sides of the pedestal, spaced guides on the pedestal in which the vertical rods are movable, an inclined rod secured to the axle and to a vertical rod between the spaced guides, wheels detachably secured to the axle, trail members hinged to the pedestal, and an outrigger attachable to the pedestal.

3. In a gun mount, a pedestal having an enlarged base, an annular spade on the base, an elevating and depressing mechanism for the pedestal, a saddle within the pedestal, a cushioning member between the saddle and the base of the pedestal, a spring between the saddle and the upper portion of the pedestal, an axle passing through the pedestal and saddle, vertically disposed rods secured to the axle on opposite sides of the pedestal, spaced guides on the pedestal in which the vertical rods are movable, an inclined rod secured to the axle and to a vertical rod between the spaced guides, wheels detachably secured to the axle, trail members hinged to the pedestal, and an outrigger attachable to the pedestal.

4. In a gun mount, a pedestal having an enlarged base, an annular spade on the base, an elevating and depressing mechanism for the pedestal, a saddle within the pedestal, a cushioning member between the saddle and the base of the pedestal, a spring between the saddle and the upper portion of the pedestal, an axle passing through the pedestal and saddle, a truss carried by the axle on each side of the pedestal and having sliding engagement with the pedestal, wheels detachably secured to the axle, trail members hinged to the pedestal, and an outrigger attachable to the pedestal.

5. In a gun mount, a pedestal having an enlarged base, an annular spade on the base, spaced rack-bars carried by the pedestal, a foot plate disposed within the annular spade and connected to the rack-bars, a shaft passing through the pedestal, pinions, on the shaft meshing with the rack-bars, and a ratchet mechanism for the shaft.

6. In a gun mount, a pedestal having an enlarged base, an annular spade on the base, spaced rack-bars carried by the pedestal, a foot plate disposed within the annular spade and connected to the rack-bars, a shaft passing through the pedestal, and pinions on the shaft meshing with the rack-bars.

7. In a gun mount, a pedestal having an enlarged base, an annular spade on the base, an elevating and depressing mechanism carried by the pedestal and a foot plate disposed within the annular spade and connected to the elevating and depressing mechanism.

8. In a gun mount, a pedestal, a saddle within the pedestal, a cushioning member supporting the saddle, a spring between the saddle and the upper portion of the pedestal, an axle passing through the saddle, vertically disposed rods secured to the axle on opposite sides of the pedestal, spaced guides on the pedestal in which the vertical rods are movable, and an inclined rod secured to the axle and to a vertical rod between the spaced guides.

9. In a gun mount, a pedestal, a saddle within the pedestal, a cushioning member supporting the saddle, a spring between the saddle and the upper portion of the pedestal, an axle passing through the saddle, and a truss carried by the axle on each side of the pedestal and having sliding engagement with the pedestal.

10. In a gun mount, a pedestal, a saddle within the pedestal, a cushioning member supporting the saddle, a spring between the saddle and the upper portion of the pedestal, and an axle passing through the saddle.

11. In a gun mount, a pedestal, an axle passing through the pedestal, a cushioning member between the under side of the axle and the pedestal, and a spring between the upper side of the axle and the pedestal.

12. In a gun mount a pedestal, an axle passing through the pedestal, a yielding suspension between the axle and pedestal and housed in the pedestal, and a top carriage

mounted on the pedestal and extending within the yielding suspension.

13. In a gun mount a pedestal, an axle passing through the pedestal, and a yielding suspension between the axle and pedestal and housed in the pedestal.

14. In a trail lock, a pair of trail members, a cranked draft coupling journaled on the inside of one of the trail members, and having reduced portions, and lugs on the inside face of the other trail member, each lug having a key-hole slot for receiving the reduced portion of the coupling.

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