

July 16, 1940.

C. P. CAULKINS

2,208,015

GUN MOUNTING

Filed Oct. 29, 1937

5 Sheets-Sheet 1

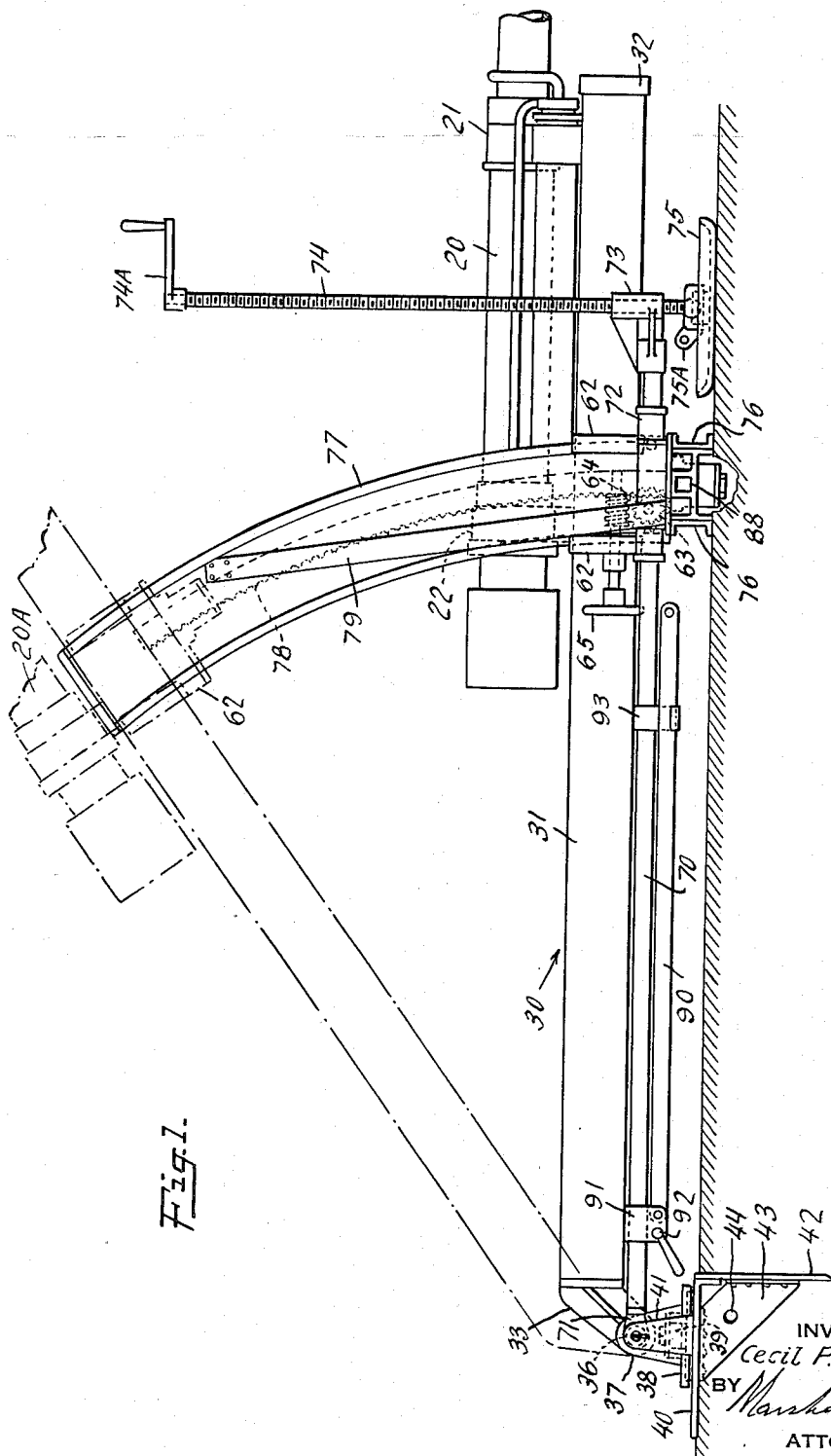


Fig. 1.

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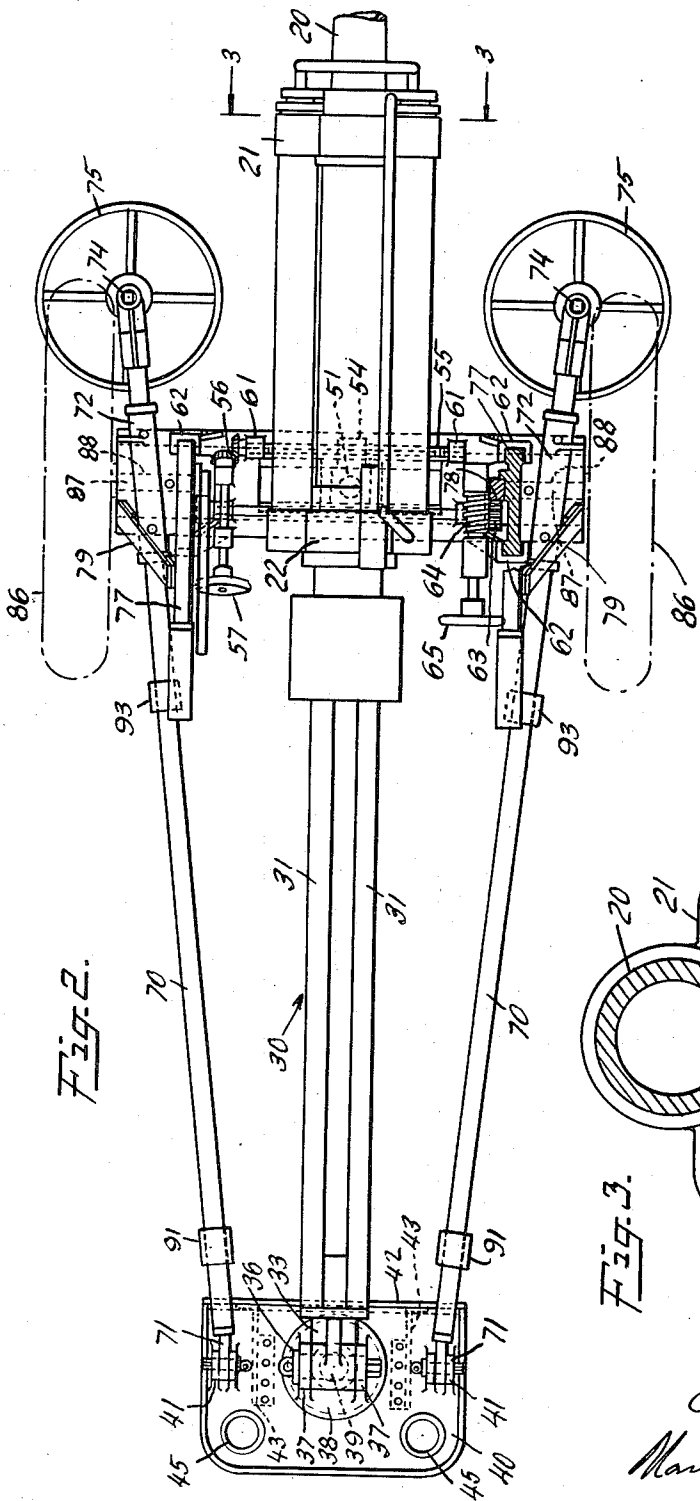


Fig. 2.

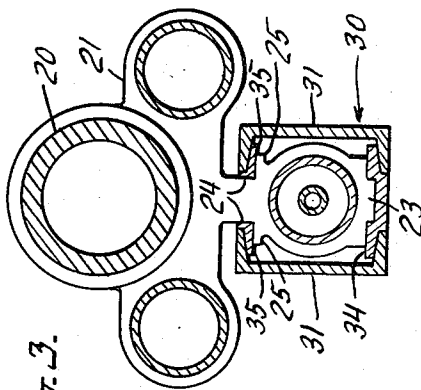


Fig. 3.

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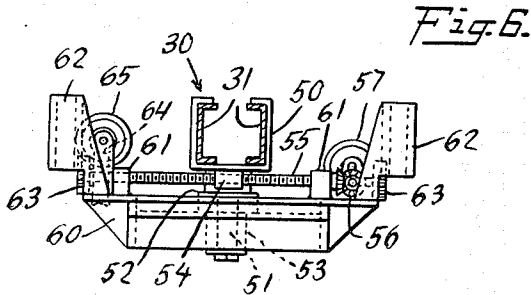
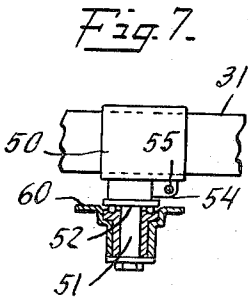
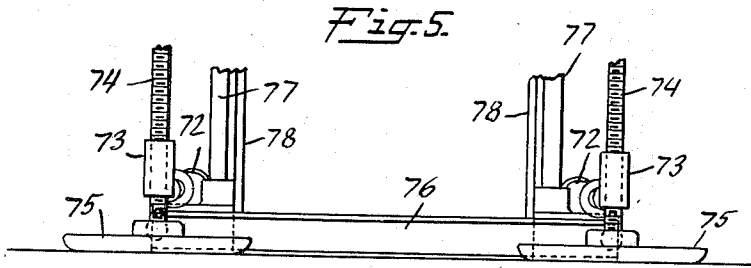
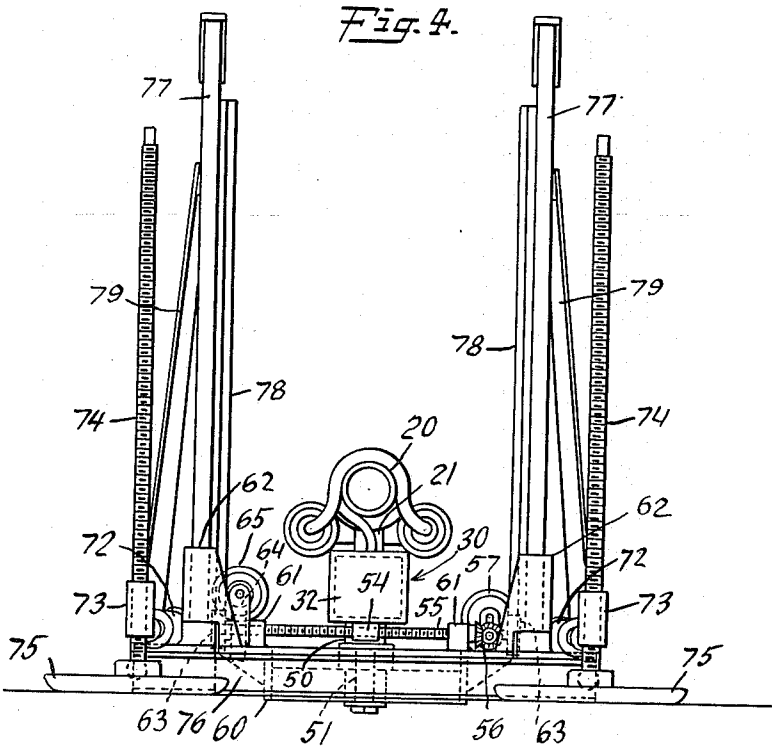
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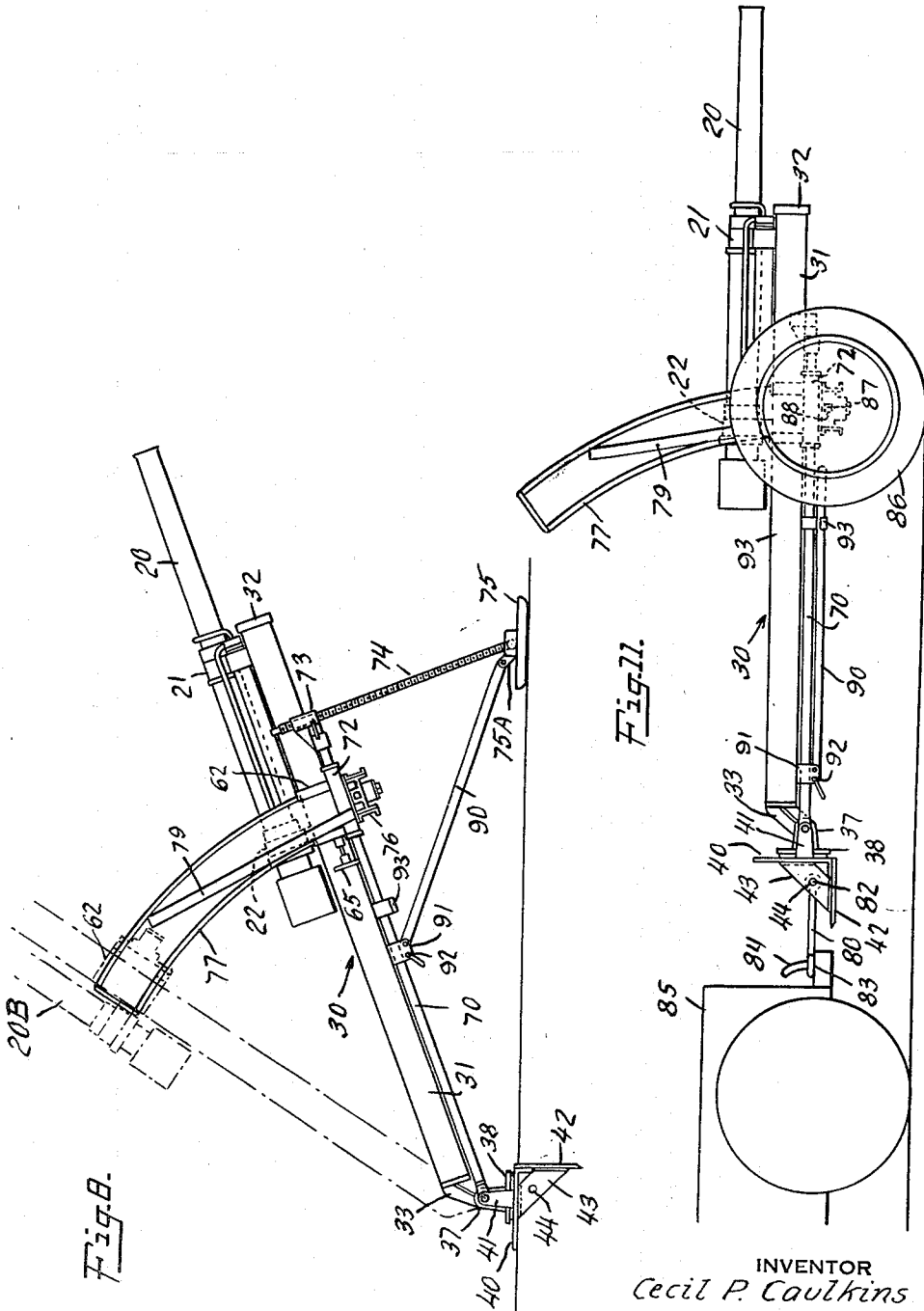
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GUN MOUNTING

Filed Oct. 29, 1937

5 Sheets-Sheet 4



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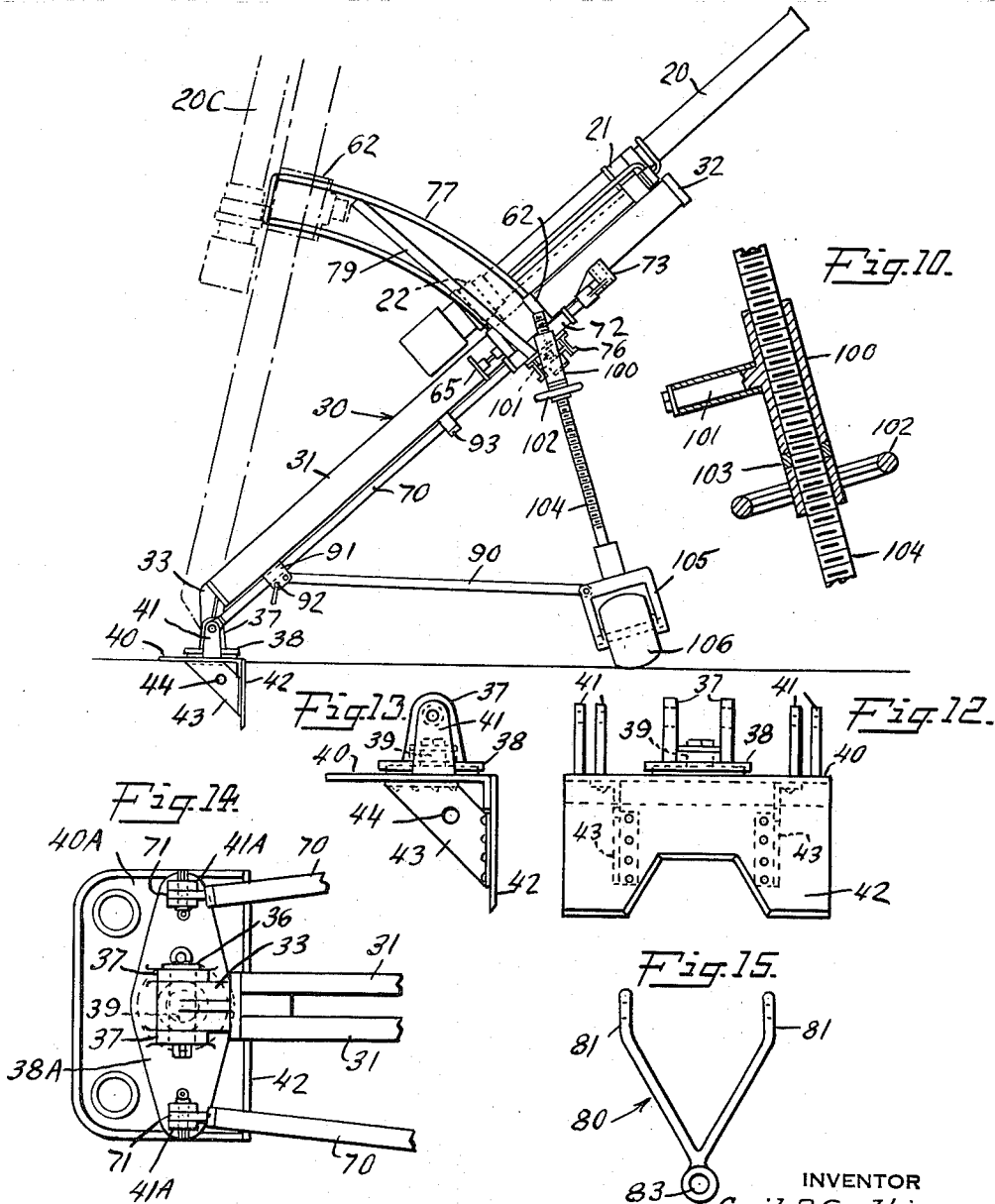
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Fig. 9.



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2,208,015

GUN MOUNTING

Cecil P. Caulkins, New London, Conn.

Application October 29, 1937, Serial No. 171,626

11 Claims. (Cl. 89—40)

This invention relates to improvements in gun mountings.

Its object is to provide a light and effective gun support which may be readily transported and quickly emplaced, by which all the forces developed by firing the gun are transmitted directly toward the ground plate of the trail, and which provides a sufficient range of elevation to make the gun adapted to both field and anti-aircraft use. The parts are so disposed that the axis of the gun in its normal horizontal position is close to the ground. The various parts of the mount may be separably connected so that they may be taken apart into mule transportable units.

Other objects will appear in the following specification in which I will describe certain structures which embody my invention, the novel features of which I will point out in appended claims.

Referring to the drawings:

Fig. 1 is a side elevation of a gun mounting which is made according to and embodies the present invention. In this figure the parts are shown in one operative position by full lines and in another by broken lines;

Fig. 2 is a plan view of the parts shown in Fig. 1, together with a pair of wheels indicated by broken lines;

Fig. 3 is a transverse section taken on the line 3—3 of Fig. 2;

Fig. 4 is a front elevation of the parts shown in Fig. 1;

Fig. 5 is a front elevation of some of the parts shown in Fig. 4;

Fig. 6 is a front elevation, partly in section, of some of the other parts shown in Fig. 4;

Fig. 7 is a view, partly in section, taken at right angles to the view shown in Fig. 6, illustrating some of the parts of the latter figure;

Fig. 8 is a view similar to Fig. 1 but on a smaller scale, illustrating other positions of the parts;

Fig. 9 is another view like Fig. 8 showing still further positions of the parts;

Fig. 10 is an elevation, partly in section, of some of the parts shown in Fig. 9, shown on an enlarged scale;

Fig. 11 is a side elevation of the gun and its mounting supported on transport wheels and connected to a towing vehicle;

Fig. 12 is a front elevation of the trail ground plate and spade shown in the preceding figures, together with a part of a trunnion plate which is mounted on the ground plate;

Fig. 13 is a side elevation of the parts shown in Fig. 12;

Fig. 14 is a plan view of the ground plate and of a trunnion plate with parts which are connected with it, illustrating a modified construction; and

Fig. 15 is a coupling which is used to connect the apparatus with a towing vehicle.

Like characters of reference designate corresponding parts in all of the figures of the drawings.

20 is a gun barrel. It is supported by yokes 21 and 22 which slide in a cradle 30. The cradle is preferably built up of channel bars 31 connected at their forward end by a housing 32 and at their rear end by a bracket 33. Their lower flanges are connected by a plate 34 upon which the yokes are supported. The plate 34 is grooved longitudinally to form tracks for lugs 23 at the base of the yokes (see Fig. 3). Angle bars 35, 35 are affixed to the upper flanges of the channel bars 31 to form guides for parts of the yoke which in Fig. 3 are designated by the numerals 24 and 25.

The cradle and the yokes also support the recoil mechanism, parts of which are shown but not described as they form no part of the present invention.

The bracket 33 at the rear end of the cradle is pivotally connected by a transverse pin 36 to upstanding lugs 37 on a plate 38 which in turn is mounted to rotate about a vertical post 39. The post 39 rises from the ground plate 40 which will be described later in detail.

Thus, the sole support for the rear end of the cradle is at the universal joint formed by the pin 36 and the post 39 which, it should be noted, is close to the ground and near the axis of the gun barrel.

The rest of the cradle and the parts which it carries is supported by a housing 50 in which the channel bars 31 are slidably mounted (see Figs. 6 and 7). 51 is a vertical pin which extends downwardly from housing 50. 52 is a shoulder which rests on ball bearings on a bushing 53 in a secondary cross frame 60, shown in Fig. 6. 54 is an internally threaded boss which forms a part of housing 50. A transverse threaded shaft 55 supported in lugs 61 on the cross frame 60 runs through this boss. The threaded shaft is held against longitudinal movement, but may be rotated through gearing 56 and a traversing hand wheel 57 to traverse housing 50 and with it the cradle and the gun barrel.

The secondary cross frame further comprises

grooved brackets 62 which run on arcuate guides 77 which will be described presently. An elevating mechanism is also mounted on this secondary cross frame 60. This comprises a gear 63 in mesh with an arcuate rack 78, a worm and gear mechanism 64 and an elevating hand wheel 65.

70, 70 are side rods, on the rear ends of which are fittings 71 pivotally supported in lugs 41 on the ground plate 40. Their pivots are in axial alinement with the pin 36. These side rods diverge and pass through bearings 72 on a main cross frame, to internally threaded sockets 73. Elevating screws 74 pass through these sockets. The lower ends of these elevating screws are connected by ball and socket joints with ground pads 75.

The main cross frame also comprises a pair of channel bars 76 to which the bearings 72, the arcuate tracks 77 and the arcuate rack 78 are attached. 79 designates braces for the arcuate tracks.

The ground plate 40, in addition to the post 39 and the lugs 41 which have been pointed out, has a spade 42 affixed to its forward end and stiffened by spaced brackets 43 in each of which is a hole 44. The ground plate is also provided with openings 45 through which stakes may be driven, or cables inserted.

80 (Figs. 11 and 15) is a coupling comprising two arms 81, 81 adapted to fit between the brackets 43 of the spade and having horizontal eyes to receive a transverse pin 82 passed through them and through the holes in the brackets 43. The arms 81 converge to a vertical eye 83 which is adapted to be placed over a pin 84 on a towing vehicle 85.

In order that the apparatus may be hauled from place to place, transport wheels 86, 86 are provided. These have stub axles 87 which fit into sockets 88 in members secured to the channel bars 76, 76 of the main cross frame, near their ends.

Before describing the parts shown in Figs. 9, 10 and 14, I will point out the operation of the parts already described.

Upon reaching a desired location, the wheels are removed and the spade 42 driven into the ground. The cradle then rests upon the ground plate 40 and the ground pads 75. It is to be understood that for this purpose the elevating screws 74 are rotated a sufficient amount to cause the weight of the apparatus, other than that which is supported on the ground plate, to be equally borne by the two ground pads 75. The gun may then be used in the position in which it is shown in Fig. 1 in full lines, and in Figs. 2 and 4. In any of its positions it may be traversed by rotating the threaded shaft 55.

From this substantially horizontal position the gun may be elevated any desired amount up to the position in which it is shown at 20A in Fig. 1 by manipulation of the elevating hand wheel 65. For higher elevations, the elevating screws 74 are turned by some suitable means, such as a crank handle 74A, until the cradle reaches the position in which it is shown in Fig. 8. Further elevation may be attained, up to the position 20B indicated by broken lines, by manipulating the elevating hand wheel 65.

For further stabilizing the mount when in the Fig. 8 position, braces 90 are provided. These are pivoted to brackets 91 slidably mounted on the side rods 70 and arranged to be secured thereto by clamps 92. The other ends of these braces are pinned to lugs 75A on the ground pads 75.

When not in use these braces are supported in clips 93 on the side rods (Figs. 1 and 11).

To adapt the gun for anti-aircraft use, the arrangements shown in Figs. 9, 10 and 14 are provided. Housings 100, having cylindrical bores, are applied to the ends of the main cross frame by means of stub shafts 101 which fit into the wheel shaft sockets 88 and on which the housings are pivotally mounted. At the lower ends of the housings are hand wheels 102 which have internally threaded hubs. Thrust bearings 103 are interposed between the housings 100 and the hubs of the hand wheels. 104 are elevating screws with which the hand wheel hubs engage. On the lower ends of these elevating screws are brackets 105 which provide bearings for the axles of ground wheels 106 at right angles to the stub shafts 101. These brackets are arranged to receive the free ends of the braces 90 which are pivotally connected to them.

By this arrangement the main cross frame may be elevated to the position in which it is shown in full lines in Fig. 9 and the gun further elevated to the position 20C indicated by broken lines.

For anti-aircraft use it is desirable to be able to traverse the gun through a complete circle, and to provide for such adjustment the ground plate 40A shown in Fig. 14 is used. The plate 38A which is mounted on the post 39 and which carries the lugs 37 for the cradle bracket 33 is in this case extended laterally and carries the lugs 41A to which the ends 71 of the side rods 70 are pivoted. Major adjustments may be made by rolling the mount around on the ground wheels 106, and the finer adjustments for aiming, made by the mechanisms previously described.

It will be observed that the mounting disclosed herein is of simple construction and very light weight. For those reasons it is easily handled and provides for every desired adjustment for the gun barrel. Its parts are so arranged that the gun may be operatively positioned close to the ground. Furthermore, the forces developed by gun fire are transmitted to the ground plate along lines which are also close to the ground plate so that the tendency to upset is practically eliminated.

Many structural modifications may be made within the scope and spirit of this invention, and I intend no limitations other than those imposed by the appended claims.

What I claim is:

1. A gun mounting comprising a ground plate, side rods pivotally connected thereto and diverging therefrom, independent means for elevating the ends of the side rods, a transverse main cross frame supported on intermediate parts of the side rods, a cradle universally pivoted at one end to the ground plate and with its other end supported on the main cross frame, and means for laterally adjusting the cradle in relation to said main cross frame.

2. A gun mounting comprising a ground plate, side rods pivotally connected thereto and diverging therefrom, independent means for elevating the ends of the side rods, a transverse main cross frame supported on intermediate parts of the side rods, a cradle universally pivoted at one end to the ground plate and with its other end supported on the main cross frame, means for laterally adjusting the cradle in relation to said main cross frame, and means for elevating the cradle in relation to said main cross frame.

3. A gun mounting comprising a ground plate,

side rods pivotally connected thereto and diverging therefrom, a ground pad at the end of each side rod, independent vertically adjustable connections between the ends of the side rods and the ground pads, a transverse main cross frame supported on intermediate parts of the side rods, a secondary cross frame supported on the main cross frame and comprising traversing mechanism, and a cradle universally pivoted at one end to the ground plate and with its other end supported on said traversing mechanism.

4. A gun mounting comprising a ground plate, side rods pivotally connected thereto and diverging therefrom, a ground pad at the end of each side rod, independent vertically adjustable connections between the ends of the side rods and the ground pads, a transverse main cross frame supported on intermediate parts of the side rods, a vertically adjustable secondary cross frame supported on the main cross frame and comprising traversing mechanism, and a cradle universally pivoted at one end to the ground plate and with its other end supported on said traversing mechanism.

5. A gun mounting comprising a ground plate, side rods diverging therefrom, a ground pad at the end of each side rod, a main cross frame supported on intermediate parts of the side rods having arcuate side brackets, a secondary frame vertically adjustable in said brackets and comprising a traversing mechanism, and a cradle universally pivoted at one end to the ground plate and supported on said traversing mechanism.

6. A gun mounting comprising a ground plate, side rods pivotally connected thereto and diverging therefrom, a ground pad at the end of each side rod, elevating screws between the ends of the side rods and the ground pads, a main cross frame having arcuate side brackets supported on intermediate parts of the side arms, a secondary cross frame vertically adjustable in said brackets and comprising a traversing mechanism, and a cradle universally pivoted at one end to the ground plate and supported on said traversing mechanism.

7. A gun mounting comprising a ground plate, side rods pivotally connected thereto and diverging therefrom, a ground pad at the end of each side rod, elevating screws between the ends of the side rods and the ground pads, a main cross frame having arcuate side brackets supported on intermediate parts of the side arms, a secondary

cross frame vertically adjustable in said brackets and comprising a traversing mechanism, a cradle universally pivoted at one end to the ground plate and supported on said traversing mechanism, manual means for actuating the traversing mechanism, and manual means for controlling the adjustment of the secondary cross frame in said side brackets.

8. A gun mounting comprising a ground plate, side rods diverging therefrom, means for supporting the side rods, a main cross frame supported on intermediate parts of the side rods having side brackets comprising arcuate tracks, an arcuate rack in one of said brackets, a secondary frame mounted on said tracks having a gear engaging said rack, a transverse threaded shaft, and a cradle universally pivoted at one end to the ground plate and supported on said transverse shaft.

9. A gun mounting comprising a ground plate, side rods diverging therefrom, elevating means for supporting the side rods, a main cross frame supported on intermediate parts of the side rods having side brackets comprising arcuate tracks, an arcuate rack in one of said brackets, a secondary frame mounted on said tracks having a gear engaging said rack, a transverse threaded shaft, a cradle universally pivoted at one end to the ground plate and supported on said transverse shaft, manual means for rotating the gear, and manual means for rotating the transverse shaft.

10. A gun mounting comprising a ground plate, side rods pivotally connected thereto and diverging therefrom, a ground pad for each side rod, an elevating screw between the end of each side rod and its ground pad, and detachable braces between intermediate parts of the side rods and the ground pads.

11. A gun mounting comprising a ground plate, side rods diverging therefrom, a ground pad at the end of each side rod, a main cross frame connected to intermediate parts of the side rods having arcuate side brackets, a secondary frame vertically adjustable in said brackets and comprising a traversing mechanism, a cradle universally pivoted at one end to the ground plate and supported on said traversing mechanism, elevating screws at the sides of the main cross frame, and ground rollers at the lower ends of the elevating screws.

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