Oct. 30, 1951 E. C. ROBERTS ET AL 2,572,882

MORTAR SIGHT BRACKET AND SIGHT

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Fig. 1.

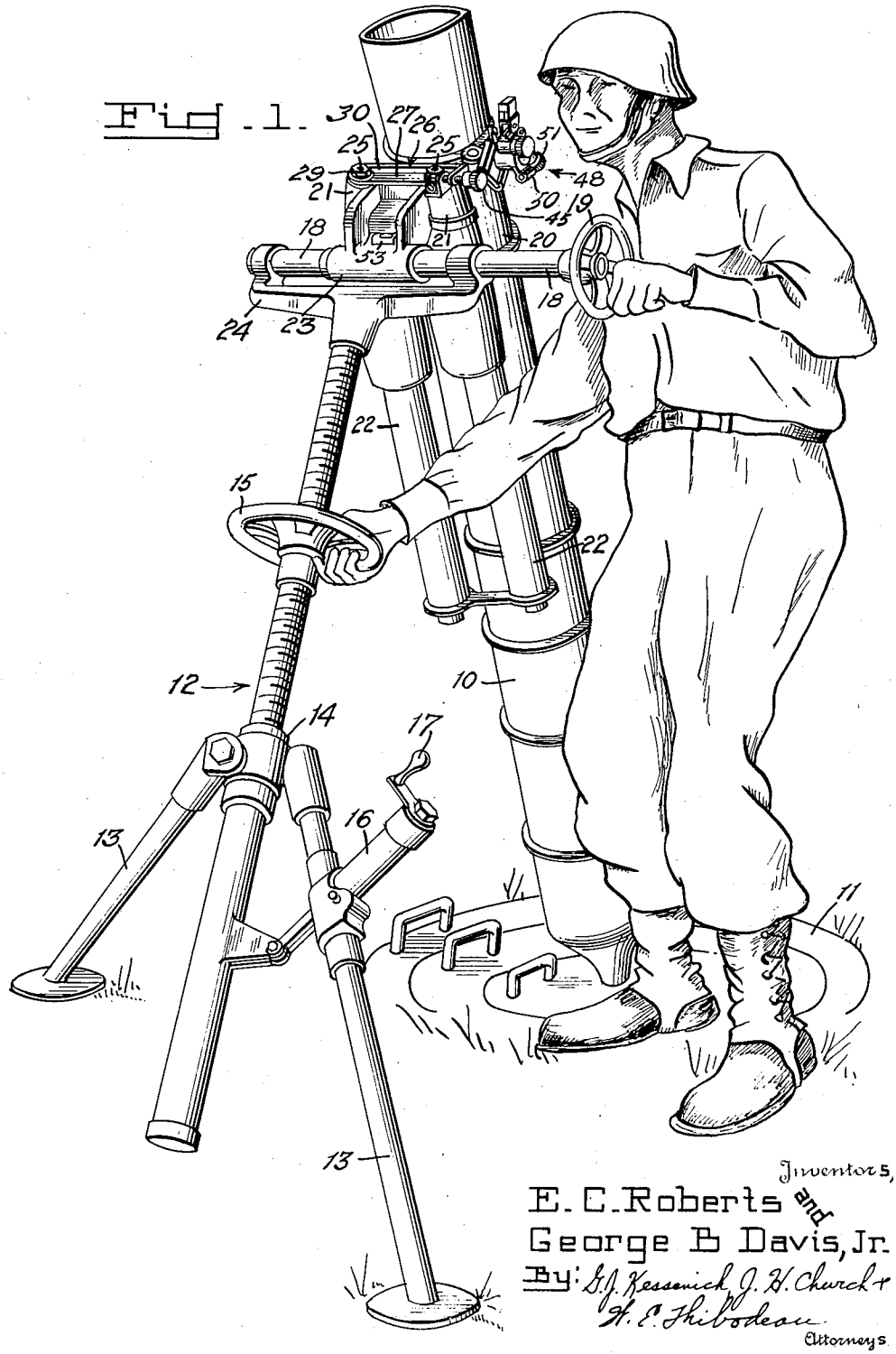

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Fig. 2.

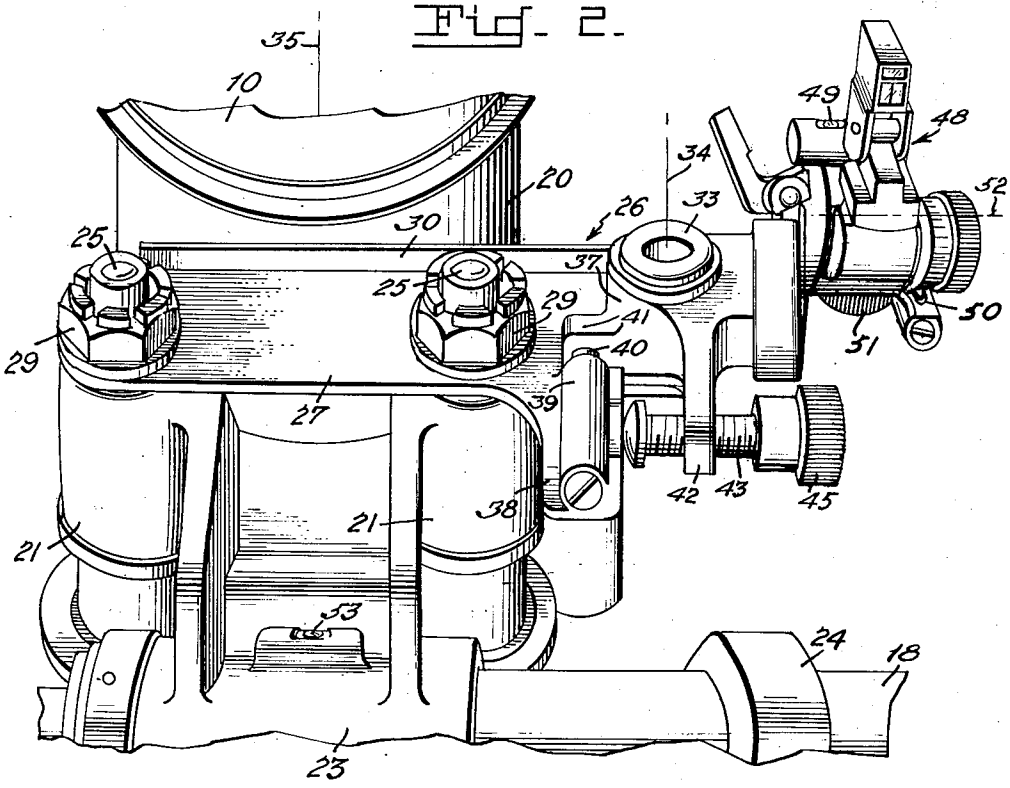

Fig. 3.

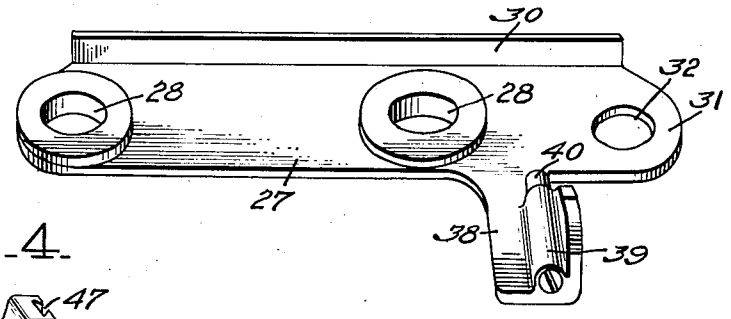

Fig. 4.

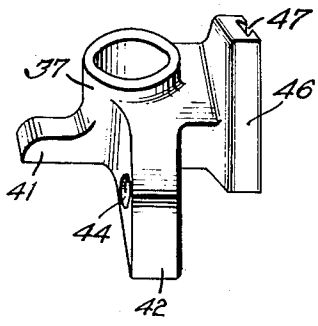

Fig. 8.

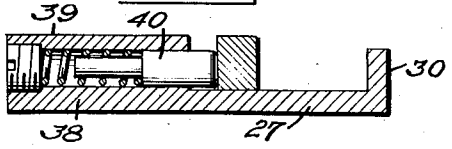

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Fig. 5.

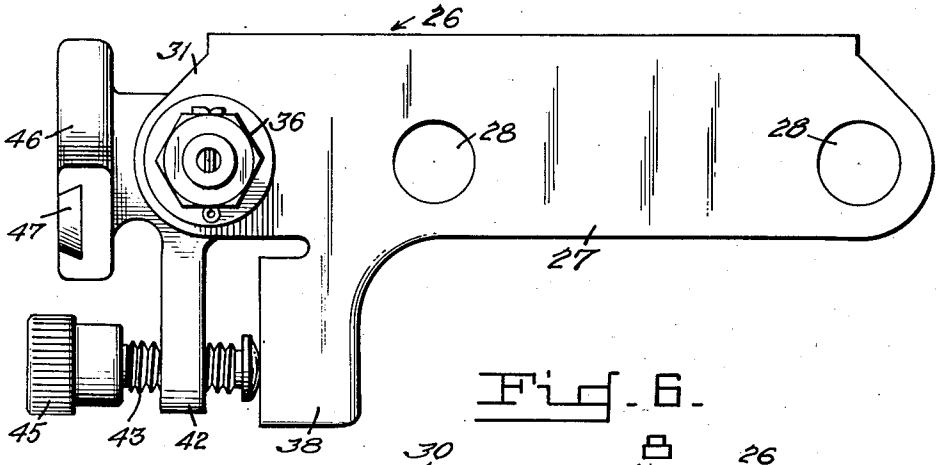

Fig. 6.

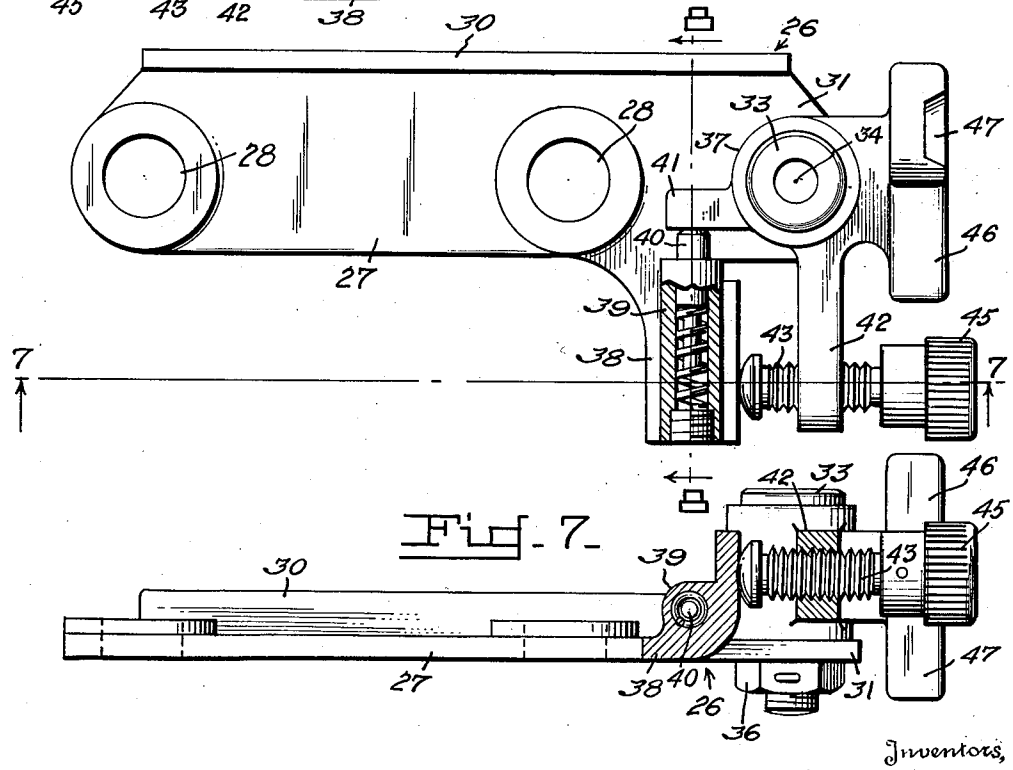

Fig. 7.

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MORTAR SIGHT BRACKET AND SIGHT

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2 Claims. (Cl. 33—48)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

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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.

This invention relates to improvements in mortar sights and sighting.

An object of the invention is to provide an adjustable sight bracket which will permit easy cross-leveling of the sight, independently of the cross-leveling means for the mortar mount.

Another object of the invention is to provide a structure which will enable a gunner to return the bore axis of a mortar to its originally set angular position, with respect to the earth, without removing cant of gun mount caused by unequal subsidence, after firing.

Another object of the invention is to enable a single operator to correct for unequal subsidence of the mortar mount without leaving his station.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification, and in which like numerals are employed to designate like parts throughout the same:

Figure 1 is a perspective view of a mortar with the invention applied thereto;

Figure 2 is an enlarged perspective view of the sight bracket and parts of the mortar;

Figure 3 is a perspective of the main body portion of the bracket;

Figure 4 is a perspective view of the pivoted hub portion of the bracket;

Figure 5 is a bottom view of the assembled bracket;

Figure 6 is a top view of the assembled bracket;

Figure 7 is a sectional view on the line 7—7 of Figure 6; and

Figure 8 is a sectional view on the line 8—8 of Figure 6.

In the past it has been the practice to attach sights to mortars with certain fixed relationships which necessitated cross-leveling the gun with each subsidence of any part of the mount in order to cross-level the sight and bring it back on the target. The present invention aims to simplify the operation of heavy mortars such as the one illustrated in the drawings, wherein the usual cross-leveling crank is difficult to reach while observing the cross-leveling bubble on the sight.

Referring now to the drawings, wherein for the purpose of illustration, is shown a preferred embodiment of my invention, the numeral 10 designates a mortar barrel.

A base plate 11 supports the base of the barrel for movement in azimuth and elevation.

The outer end of the barrel is supported by a bipod 12 which comprises legs 13, an elevating

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mechanism 14 having a hand wheel 15, a cross-leveling mechanism 16 having an operating crank 17, and a traversing mechanism 18 having a hand wheel 19. A saddle 20 is secured to the barrel 10 and is formed with an enlargement 21 for mounting shock absorbers (not shown) housed within tubes 22. The enlargement 21 carries a tubular member 23 pivotally engaged with the traversing mechanism 18. A yoke 24 secured to the elevating mechanism 14 and pivotally connected to the traversing mechanism completes the pivotal connection between the barrel 10 and the bipod 12. The above description applies to structures that are known and are used only to illustrate one form of gun with which the hereinafter disclosed invention may be used.

Extending outwardly from the enlargement 21 are shock absorber rods 25 by means of which an adjustable sight bracket 26 is secured to the gun.

The bracket comprises a main body portion 27 having holes 28 for receiving the shock absorber rods 25. Nuts 29 screw-threaded on the ends of the shock absorber rods securely hold the main body portion 27 against the enlargement 21 of the saddle 20.

One edge of the body portion 27 is struck up to form a stiffening rib 30.

The body portion 27 is formed at its end 31 with an opening 32 for receiving one end of a pivot pin 33, whose axis 34 is parallel with the bore axis 35 of the barrel 10. The pivot pin is secured in position on the end 31 of the body portion by a nut 36.

A hub 37 is mounted on the pivot pin 33 for pivoted oscillatory movement about the axis 34 of the said pin.

The body portion 27 is formed with an offset 38 extending from its edge opposite the rib 30 and carries a housing 39 in which is a spring pressed plunger 40.

An abutment arm 41 extends from the hub 37 into the path of movement of the plunger 40. The hub 37 is formed with an adjusting arm 42 which screw threadedly receives an adjusting screw 43 in a similarly threaded hole 44 near its outer end. The adjusting screw 43 abuts the offset 38 of the body portion 27 thus providing resistance to the thrust of the spring pressed plunger 40, thereby holding the hub 37 in an adjusted position. A knob 45 on the screw 43 provides easy adjustment thereof.

The hub 37 also carries a fixture arm 46 formed with a dove-tailed slot 47 for receiving a similarly shaped bracket of a sighting device such as a standard U. S. M4 sight.

The collimator sight 48 is equipped with the usual bubble-type cross-level 49 and longitudinal or elevation level 50.

In accordance with conventional practice, the collimator is mounted in a bracket or frame hav-

ing a tang received in slot 47. When so positioned, the line of sight of the collimator may be rotated by actuation of knob 51 about a second axis 52 which is at all times normal to first axis 34. The line of sight is, of course, normal to the aforesaid second axis. This second axis is parallel to the axis of cross-leveling bubble tube 49 so that, when the bubble thereof is centered, the axis 52 is known to be horizontal. The line of sight of the collimator is parallel to the axis of longitudinal bubble tube 50 for zero deflection so that the proper angle of elevation may be introduced by the elevation scale on knob 51 in conjunction with the aforesaid bubble tube 50.

A bubble-type cross-leveling device 53 is installed on the tubular member 23 whereby the axis of the traversing mechanism 18 may be placed in a horizontal position.

It is to be understood that the form of our invention, herewith shown and described, is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of our invention, or the scope of the subjoined claims.

The operation is as follows:

Let it be assumed that the axis of the shaft by which train is effected, is originally horizontal and that the line of sight is horizontal. This is accomplished by manipulating handle 17 until bubble 53 is centered. Hand wheel 15 is turned to elevate the mortar barrel to its proper angle to correspond with the range or distance of the target from the piece. This range is determined by the setting of collimator sight 48 and the centering of the bubble in longitudinal or elevation level 50. Of course, the bubble in cross level 49 is also centered at this time.

When the mortar piece is fired settling and subsidence is not usually uniform, the weapon is no longer correctly laid to give the proper range, and cross leveling bubble 53, and sight bubbles 49 and 50 are no longer centered. It is obvious that by manipulating all the controls including crank 17, the gun can be reaimed. However in a large mortar this would require the service of more than one man, because the man at the sight must constantly keep his eye on the eye piece of the collimator, requiring a second man to work crank 17. By means of our novel sight bracket only wheels 15 and 19 and screw 45 need be manipulated by a single operation to correct for unequal subsidence. This is accomplished as follows. First knob 45 is turned to recenter bubble 49. This is effected because the line of sight is rotated about an axis 34 which is parallel to the axis of the barrel. The line of sight is now level and wheel 19 is rotated to bring this line of sight back on the target. Hand wheel 15 is then operated to reset the piece in elevation to its original firing angle. This is accomplished by observing that longitudinal bubble 50 is centered within its tube. Centering of bubble 50 may throw off cross level bubble 49 slightly, hence the procedure is repeated until final adjustment no longer changes the setting of bubble 49. The entire adjustment is quickly accomplished in less time than it takes to describe the procedure. It is to be noted, that bubble 53 is only used when initially laying and setting the mortar. For leleveling after firing and subsidence, this bubble is disregarded.

A single operator is thereby enabled to correct for unequal subsidence of the mortar amount, without leaving his station since he can observe the cross-level bubble 49 and make appropriate cross-leveling adjustments at knob 45 without moving his head.

We claim:

1. For use with a gun of the mortar type including means for supporting the barrel of said gun, a bracket secured to said gun supporting means, hub means pivotally mounted on said bracket for oscillatory movement about an axis parallel to the axis of said gun, screw adjusting means secured to said hub for effecting oscillation and adjustment of said hub about its axis, spring biased plunger means for maintaining said hub in fixed oscillated position, a telescopic sight mounted on said hub including a first cross level indicator responsive to actuation of said screw adjusting means, a second longitudinal level indicator mounted on said telescopic sight for adjustment about an axis normal to said hub axis, second screw adjusting means for leveling said longitudinal level indicator, whereby actuation of said first screw adjusting means and said second screw adjusting means will return said telescopic sight to its original target after subsidence caused by firing.

2. The combination with a mortar and telescopic sight and means for facilitating subsidence correction for said mortar comprising a bipod, a saddle secured to the upper end of said bipod for supporting the barrel of said mortar, hand wheel means on said bipod for elevating said mortar barrel, second handle means on said bipod for initially cross leveling said telescopic sight, traversing mechanism forming a part of said saddle and secured to said barrel to train said barrel upon a target, a bracket fixedly mounted on said saddle having an opening at one end, a pivot pin secured to said bracket and extending into said opening, a hub mounted on said pin for oscillatory movement about an axis parallel to the bore axis of said mortar, an adjusting arm forming part of and extending from said hub, said arm having an opening for accommodating an adjusting screw, spring biased plunger means for holding said hub in an adjusted position, means on said hub for mounting said telescopic sight, a first cross leveling bubble and second longitudinal bubble forming part of said sight, whereby upon subsidence caused by firing of said mortar, said hand wheel, traversing mechanism and adjusting screw are actuated to reaim said motor upon its original target without the use of said second cross leveling handle means.

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