June 26, 1951 S. WEISS ET AL 2,558,024

MORTAR BASE PLATE

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Fig. 1.

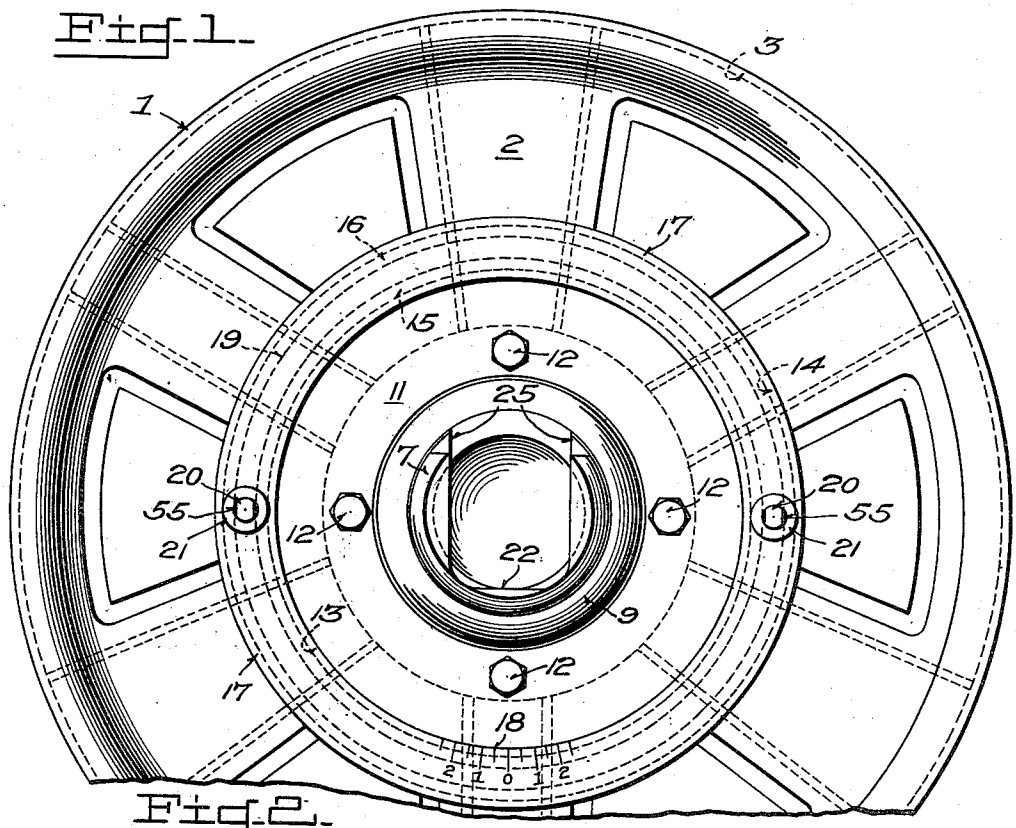

Fig. 2.

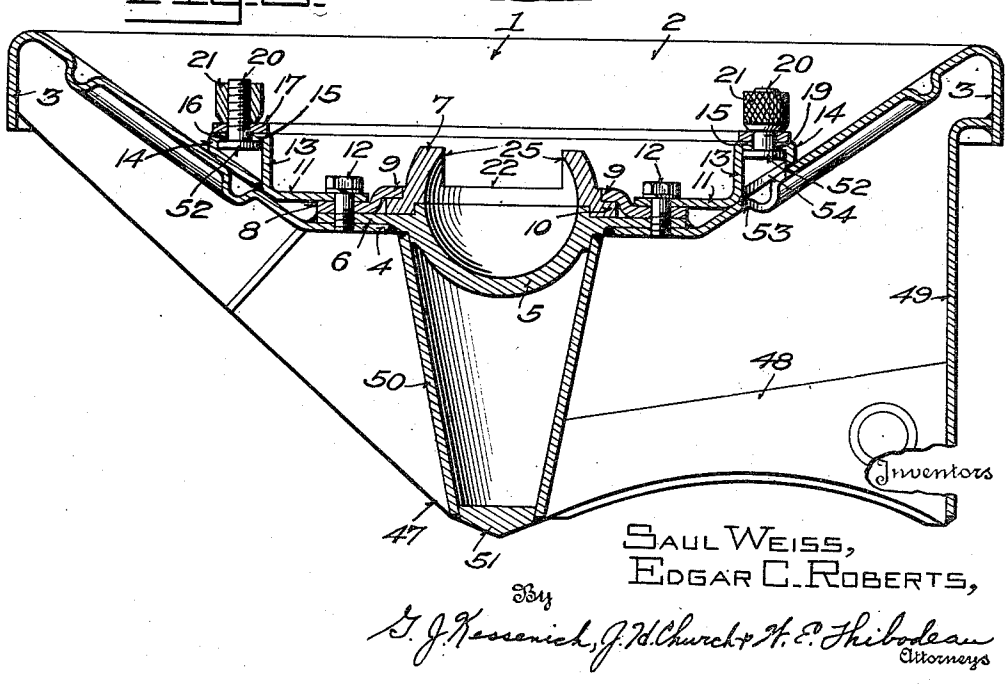

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Fig. 3.

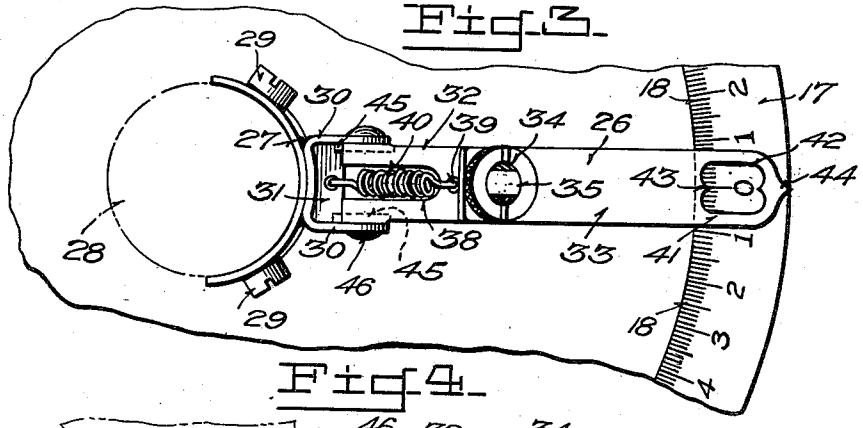


Fig. 4.

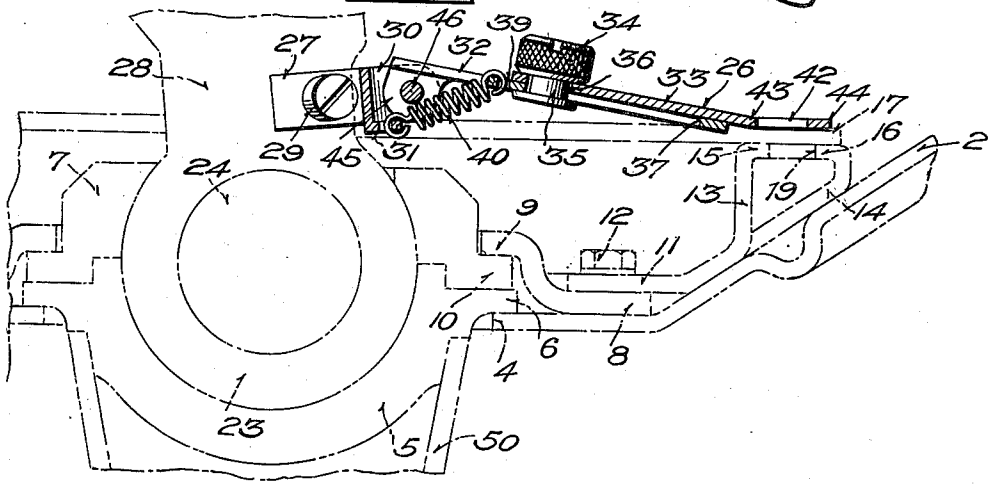
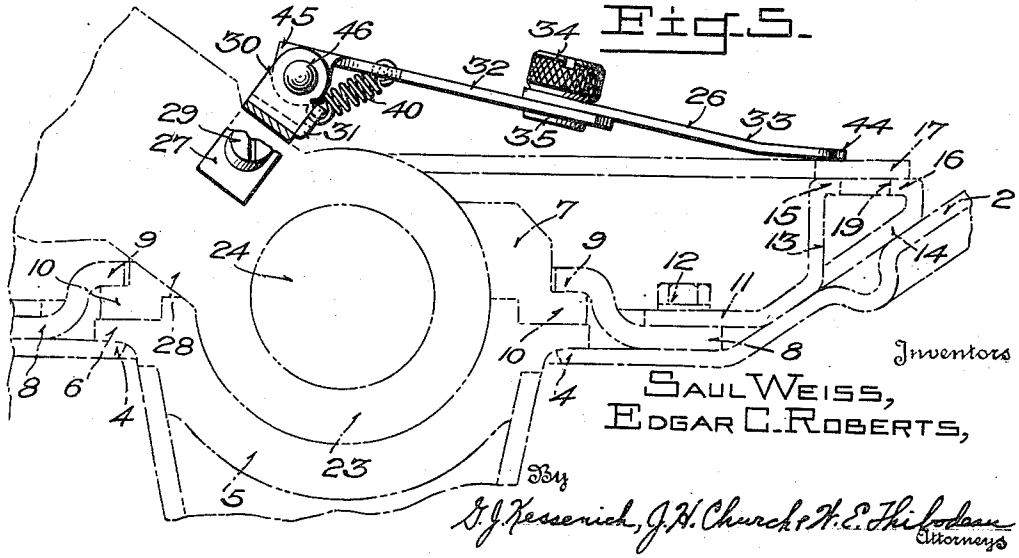


Fig. 5.



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MORTAR BASE PLATE

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4 Claims. (Cl. 89—37)

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

This invention relates to improvements in mortar socket base plates whereby the mortar may be traversed in its socket 360°.

Since the introduction of paratroopers and airborne infantry into warfare, it has become of utmost importance that combatant personnel be provided with weapons adapted to repel sudden attacks by the enemy from the rear. However, the conventional light high angle fire mortar is ill adapted for this purpose for the reason that its rear and lower end portion terminates in a ball which is mounted in a socket, the construction of which is such that it permits only a limited traverse of the mortar. Hence it has heretofore been necessary, before the direction of fire could be reversed or even changed through a substantial angle in azimuth, to change the position of the base plate or make other time consuming readjustments while heavy casualties could be inflicted.

It is therefore a major purpose of this invention to provide a mortar base plate which will permit the mortar to be rapidly rotated without changing the position of the base plate or removing the mortar from its socket.

Another object is to provide an improved ball socket means which will permit an almost instantaneous 360° traverse of the mortar while the mortar remains in its socket.

The additional objects, advantages and features of this invention reside in the construction, arrangement and combination of parts involved in the preferred embodiment of the invention illustrated in the accompanying drawings, in which:

Figure 1 is a fragmentary top plan view of the invention as applied to a mortar base plate,

Figure 2 is a vertical cross-sectional view of the same,

Figure 3 is a top plan view to an enlarged scale of an azimuth indicator with the mortar in maximum or substantially 90° elevation.

Figure 4 is a cross sectional view of the indicator of Figure 3 taken in a vertical plane extending centrally and longitudinally of the indicator with the mortar in maximum elevation, and

Figure 5 is an elevational view, partly in section, of the indicator, in a plane parallel to the plane of Figures 3 and 4, but showing the positions of the indicator parts when the mortar is at substantially minimum elevation.

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The preferred embodiment of this invention depicted in the accompanying drawings includes a circular metal socket base plate member 1, having a circular concave platform 2, provided with a downwardly extending circumferential apron 3 and having a central open portion 4 in which there is rigidly secured a stationary socket or lower section 5 having an integral or radially extending flange 6. On this socket there is mounted a rotatable socket cap or upper section 7 which is movably secured in position by means of a retainer ring 8 having a raised offset inner portion 9 which overlaps a circular outwardly extending flange 10 formed integral with the socket cap. The construction is such that the upper section 7 may at all times be freely rotated upon and with relation to lower section 5.

A circular supporting member 11 is mounted above the retainer ring and the socket flange 6 and together with each of these members is rigidly secured by cap screws 12 to the platform 2 in a manner which may be readily understood by referring to Figure 2.

This supporting member has two spaced cylindrical coaxial flanges 13 and 14 extending upwardly from its peripheral portion and having respectively, outwardly and inwardly extending flat rim portions 15 and 16. These flat rim portions (see Figure 2) extend toward but are spaced apart from each other to provide a base for an azimuth ring 17 having any suitable indicia 18. The space between the rims defines a circular slot 19. Oppositely positioned bolts 20 provided with knurled nuts 21 extend through the azimuth ring and the slot 19 in a manner whereby the azimuth ring may be readily rotated to any desired angular position with reference to the base plate and then rigidly clamped to the rim portions 15 and 16 by tightening nuts 21.

Referring now to Figure 2, it will be noted that the socket cap 7 has a right-angular cut away upper portion 22 which serves to admit a ball 23 having parallel opposite "flats" 24. This ball forms the extreme end portion of the conventional mortar indicated in broken lines in Figures 4 and 5. In mounting the mortar on the plate, the ball is inserted in the socket by holding the planes of its "flats" parallel to the planes of the vertical edges 25 of the cutaway portion of the socket cap and pushing the ball into the socket. The ball is now rotated 90° to thereby secure the mortar against removal from the base plate. Alternatively the ball may be secured against removal from its socket by rotating cap or ring 7.

Referring to Figures 3, 4, and 5, it will be seen

that there is also provided an azimuth indicator 26 having a circular band segment 27 which may be secured to the shank 28 of the mortar by any suitable means such as screws 29. Segment 27 is provided with two perforated integral spaced apart ears 30 and a perforated lug 31. The azimuth indicator also includes outwardly and parallelly extending bars 32, 33 which are operatively connected with each other in such a manner that the outer bar 33 can be moved radially on the bar 32 and clamped in the desired position of radial adjustment by a nut and bolt means 34, the shank 35 of which extends through an opening 36 provided in the bar 33 and an elongated slot 37 provided in the bar 32. The inner portion of the bar 32 is slotted at 38 and perforated at 39 for the purpose of permitting a coiled spring 40 to be operatively connected to the perforated lug 31 on the band segment and to the bar 32 to urge the outer end 41 of bar 33 against the flat upper surface of the azimuth ring 17.

Referring now particularly to Figures 3 and 4, it will be noted that this outer end 41 of the bar 33 has an opening 42 and is also provided with an inner pointer 43 and an outer pointer 44 whereby the angular position of the mortar may be easily read on the azimuth ring regardless of the amount of the elevation or depression of the mortar. It will also be noted that the bar 32 is provided with ears 45 which are pivotally secured to the ears of the band segment 27 by means of a rivet 46.

The socket platform may, if desired, be formed in any suitable manner adapted to provide a support for the socket and its rotatably mounted cap. However, it may be advantageously provided with suitable ground engaging means, such as for instance, fixedly secured spades 47 and 48, a spadeshield 49 and a central hollow post or spike 50. This spike is preferably provided with a pointed plug 51. Each of the above mentioned ground engaging means are preferably welded to the plate in a manner adapted to make a strong integral supporting base capable of withstanding the shocks and concussions incident to mortar firing.

From Figure 2, it will be noted that the heads 52 of the bolts 20 are wider than the slot through which the shanks of these bolts extend. In order that the head of these bolts may be inserted beneath this slot, suitable aligned openings 53 and 54 are provided in the base plate and in the arm 14. In order to prevent these bolts from turning in this slot, the opposite sides of the shanks of the bolts are preferably flattened as is indicated at 55, Figure 1.

Referring now particularly to Figure 5, it will be noted that, as the muzzle of the mortar is lowered into position for firing, its shank 28 must be depressed in the cut-away portion 22 of the mortar cap, and therefore only a limited traverse is possible between the mortar and the vertical edges 25 of the cut-away portion 7. However, since the cap is rotatably mounted on its socket, it in no way prevents the rotation of the mortar three hundred and sixty degrees. The term "normally" as used in the claims is to be interpreted to mean the position or relation of the parts referred to when the mortar is in actual use on substantially level terrain.

The above described invention is disclosed in the best construction known to the inventors but it is to be understood that this is purely exemplary and that other modifications may be made, such, as for instance, forming or welding the socket and its cap integral with each other and rotatably mounting the combined socket and cap structure on the base plate in any suitable manner without departing from the spirit of the invention or the scope of the appended claims. In the claims, the terms "normally horizontal" and "normally vertical" refer to the positions of the parts as shown upon the drawing.

We claim:

1. In a mounting base for a mortar barrel provided with a mounting ball, having diametrically opposite parallel flats, a generally circular base plate, means carried by said plate centrally thereof forming a generally spherical socket comprising a lower hemispherical portion fixed to said plate and an upper ring portion, means securing said ring portion on said lower portion for rotation thereon, said portions being divided on a normally horizontal equatorial plane of said socket, said ring portion having oppositely disposed portions cut away to form notches whose side edges are defined by the intersection with said ring of normally vertical parallel planes spaced a distance equal to the separation of the flats on said mounting ball, whereby said ball may be inserted into said socket when said flats thereon are coplanar with the corresponding side edges of said cut away portions, said ball being retained in said socket against removal therefrom, by relative angular movement of said ball and ring portion about an axis normal to said equatorial plane.

2. In a mortar, a barrel having a mounting ball rigid therewith, a circular dished base plate, means forming a spherical socket secured to said base plate centrally thereof, said socket comprising a lower hemispherical portion rigid with said base plate, and an upper ring portion rotatable on said lower portion about a normally vertical axis, said ring portion being cut away to coact with diametrically opposite flats on said ball to pass said ball into said socket only for a definite angular relation of said ball and ring portion, whereby said ball may be inserted into said socket for one rotational position only of said ball relatively to said ring portion, and secured therein by relative rotation of said ball and ring about said normally vertical axis.

3. In a mounting for a mortar barrel provided with a mounting ball having diametrically opposite parallel flats formed thereon, a base plate, means fixed to said plate and forming a hemispherical upwardly-facing socket in which said ball fits smoothly, a ring carried by said base plate for rotation about the normally vertical axis of said socket, said ring having an internal partly-spherical surface forming a continuation of the hemispherical surface of said socket, there being a pair of diametrically-opposite notches in said ring having their sides defined by the intersection with said ring of a pair of parallel planes symmetrically disposed on opposite sides of said normally-vertical axis and spaced by a distance substantially equal to the distance between the flats on said ball, whereby said ball may be inserted into said socket with its flats parallel with said planes, and held against removal from said socket by rotation of said ring.

4. In a ball and socket mounting for a mortar barrel, a mounting ball attached to the breech end of the barrel and having a pair of diametrically opposite parallel flats, a base plate, a first member having a hemispherical upwardly-facing socket secured to said base plate, a ring member

secured to said plate for rotation on said first member about a normally vertical axis, the inner surface of said ring member being a portion of a spherical surface and forming a continuation of the hemispherical surface of said first member, there being a pair of diametrically opposite notches in said ring member each having a width equal to the separation of the flats on said wall, whereby said ball may be freely inserted into said socket and retained therein by relative rotation about a normally vertical axis between said ball and ring.

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