July 31, 1962 R. S. ROWE 3,046,843

MORTAR BASE PLATE

Filed July 15, 1960

Fig. 1.

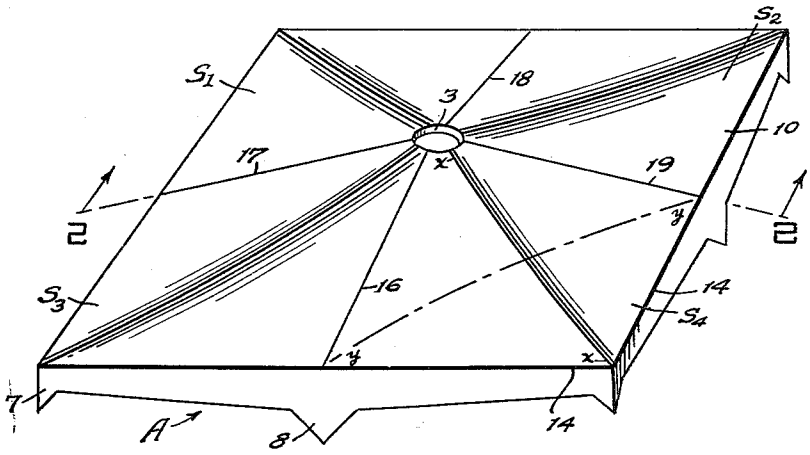


Fig. 3.

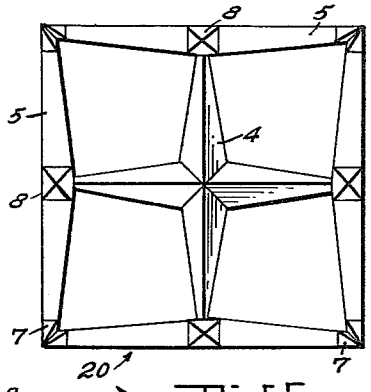


Fig. 2.

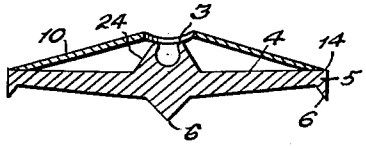


Fig. 4.

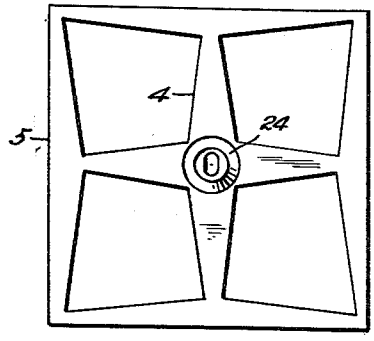


Fig. 5.

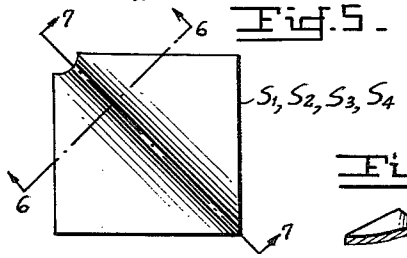
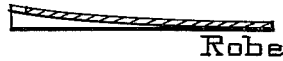


Fig. 6



Fig. 7.



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United States Patent Office

3,046,843
Patented July 31, 1962

3,046,843
MORTAR BASE PLATE

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Filed July 15, 1960, Ser. No. 43,252
1 Claim. (Cl. 89—37)
(Granted under Title 35, U.S. Code (1952), sec. 266)

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

This invention relates to a new and novel base plate and has for its main object to produce a mortar base-plate that will withstand adequately the thrust from a fired mortar tube or other thrust producing device.

Another object of this invention is to produce a thrust absorbing and thrust dissipating base plate of light weight so as to increase its portability.

A further object of this invention is to produce a base-plate which will distribute the reactive loading thereon substantially uniformly throughout the entire structure so as to reduce undesirable stress concentrations resulting in subsequent shear failures of the supporting medium.

A further object of this invention is to enable a mortar base-plate to easily and stably seat itself in the supporting medium during the firing operation.

These and other objects and advantages will be apparent from the following detailed description and accompanying drawings in which:

FIGURE 1 is an isometric view of the base-plate structure illustrating as inventive features thereof the tapered-edge spades and doubly-curved top surface constructed of solid sheet material or alternatively, of prestressed concrete; or reinforced plastic.

FIGURE 2 illustrates a cross-sectional view in elevation taken on line 2—2 of FIGURE 1;

FIGURE 3 illustrates a view of the underside of the mortar base-plate showing the framework of tapered edge spades of the base plate which may be of a geometric configuration other than that illustrated;

FIGURE 4 illustrates a plan view of the base-plate framework;

FIGURE 5 is a top plan view of one of the portions of the top surface;

FIGURE 6 is a section taken along line 6—6 of FIG. 5; and,

FIGURE 7 is a section taken along line 7—7 of FIG. 5.

Referring now to the drawing and particularly to FIGURES 1 and 3 thereof, there is shown an improved base-plate A comprised of a thin, doubly-curved top plate section **10**, having at its center a suitable recess **3** adapted for mounting therein a conventional mortar tube socket, not shown, and a framework **20** generally comprised of spade members **4** and **5** having pointed feet members **7** and **8**. Top surface **10** is comprised of four equal portions S_1, S_2, S_3, and S_4, respectively, joined at their mutually adjacent edges at **16**, **17**, **18** and **19**, each portion being double curved and generated by a straight line; that is, the surface along X—X is concave, while the surface along Y—Y is convex. Accordingly, any vertical section through one of said portions parallel to an edge thereof would depict a straight line as seen in FIG. 2; the intersection between one of said portions and any vertical plane at 45 degrees to the portion edge would depict a parabola, as seen in FIG. 6 and the intersection with a portion of any horizontal plane would depict a hyperbola as seen in FIG. 7. It is to be noted that the mutually adjoining portion edges at **16**, **17**, **18**, and **19** are of a longer dimension than the opposite corresponding outer edges of each of portions S_1, S_2, S_3, and S_4.

Top-plate section **10** may be formed in a number of ways, e.g. (1) stamping sheet metal on metal forms, or (2) hot-forming the plate on suitable dies, subsequently quenching and tempering the plate to obtain desired physical characteristics.

Referring now to FIGURES 2 to 4, there is illustrated a frame-work generally designated **20** composed of tapered center spades **4** and tapered edge spades **5**. Tapered spades **4** and **5** terminate sharply in hardened, pointed edges **6**, as shown in FIGURE 2; however, these terminal edges may be of any geometric design deemed suitable, e.g. curved, serrated, etc., so long as it fulfills the function of easily digging into the supporting medium. The tapered edge spades **5** may also have a longitudinally curved configuration as well as being straight. Socket **24** comprises an integral portion of framework **20** and is shown as a frustum of a cone having the recess **3** for receiving the spherical terminal end of a conventional mortar base-cap, not shown.

Top-plate section **10** and framework **20** may be suitably joined at **14** as by welding, brazing, etc. thereby forming an integral, rigid base-plate structure A.

In use, the reactive thrust from a firing mortar is delivered to socket **24** of base-plate A. This concentrated loading is distributed throughout framework **20** to the top-plate section **10**. Each successive firing progressively more firmly sets spades **4** and **5** into the supporting medium resulting in a more stable platform.

While the foregoing particularly describes the preferred embodiment of my invention, it is obvious that many modifications and variations in the details of construction, combination and arrangement of parts, may be resorted to without departing from the spirit and scope of the appended claim.

What is claimed as new and useful is:

A mortar base-plate structure supported on the ground and adapted for use in firing a mortar, including in combination, a unitary frame of regular design comprising, a socket centrally disposed in said frame; a plurality of center spade members radiating outwardly from said socket; a plurality of edge spade members integral, one each, with the outer ends of each said center spade member, said edge spade members being integrally joined at their ends to completely surround said center spade members; a first plurality of downwardly depending hardened points integral one each with the lower side of each outer end of each said center spade member and a second plurality of downwardly depending hardened points integral one each with the joining ends of said edge spade members for engagement with the ground; and a doubly curved top surface fixed to the top surface of said rigid frame, said top surface comprising a plurality of doubly curved portions developed by straight line generatrices and having coplanar outer extremities, each said doubly curved portion being of a curvature whereby a vertical section parallel to an edge of one of said portions depicts a straight line; the intersection between a portion surface and a vertical plane at 45° to a section edge depicts a parabola and the intersection between a section surface and a horizontal plane depicts a hyperbola.

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