Dec. 17, 1946. A. ADELMAN 2,412,593

PROPELLENT CHARGE HOLDER

Filed Nov. 8, 1941

Fig-1-

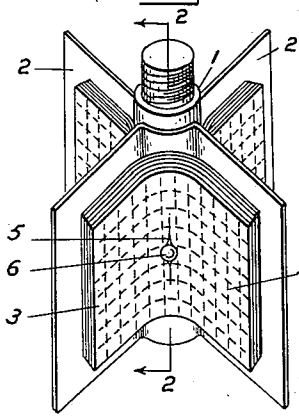


Fig-2-

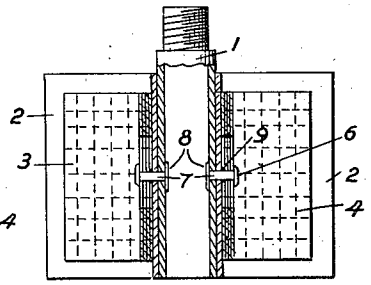


Fig-3-

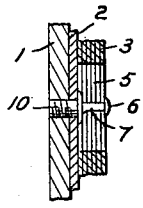


Fig-4-

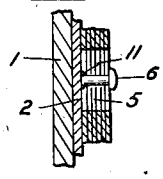


Fig-7-

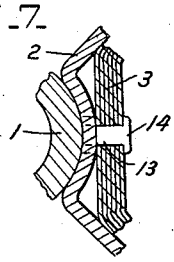


Fig-5-

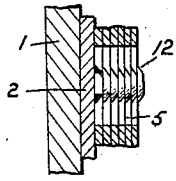


Fig-6-

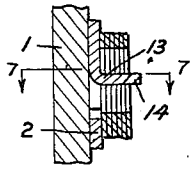


Fig-8-

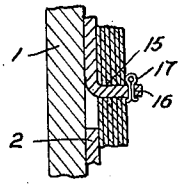


Fig-9-

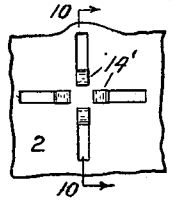


Fig-10-

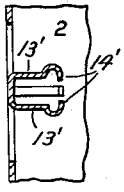


Fig-11-

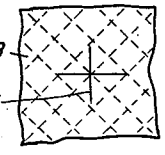


Fig-12-

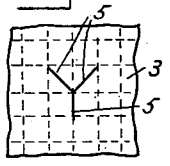


Fig-13-

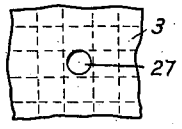


Fig-14-

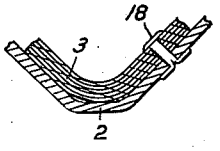


Fig-16-

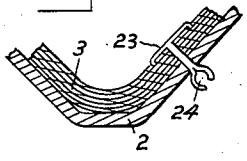


Fig-15-

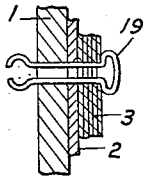


Fig-17-

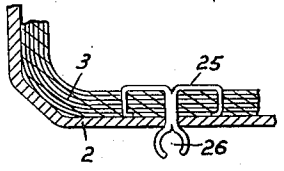


Fig-18-

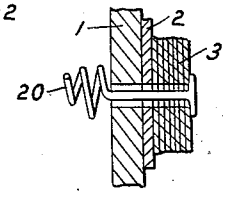
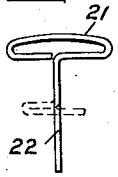


Fig-19-



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PROPELLENT CHARGE HOLDER

Arthur Adelman, Chesaning, Mich.

Application November 8, 1941, Serial No. 418,346

14 Claims. (Cl. 102—49)

(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 me of any royalty thereon.

This invention relates to propellent charge holders and in particular to a charge holder for the external charge increments in the mortar type of shell.

In the types of mortar shells now in use an igniting charge is carried in the tail and auxiliary charges are carried externally of the tail, usually by the stabilizing vanes. The carrying of these auxiliary charges has been variously accomplished by slipping them over the tail piece, by snapping them behind projections on the fins, by flexing them into holes in the fins and by slipping them under spring clips.

The chief desiderata of charge-holding devices are security of holding and ease of application. None of the existing types offer both qualities to the desired degree. In use the charges must often be adjusted by removal of increments in cold and stormy weather and in darkness. The cold may necessitate application of the charges with gloved hands in which case charge holders requiring a fine degree of manipulation would be ruled out.

It is therefore an object of the invention to provide a propellent charge holder which shall be easy of manipulation and which shall afford a secure holding of the charge.

The specific nature of the invention as well as other objects and advantages thereof will clearly appear from a description of a preferred embodiment as shown in the accompanying drawing in which:

Figure 1 is a perspective view of a tail piece with fins and sheet charges therebetween.

Figure 2 is a sectional view taken on the line 2—2 of Figure 1.

Figures 3, 4, 5, 6 and 8 are views similar to that of Figure 2, showing modifications.

Figure 7 is a sectional view taken on the line 7—7 of Figure 6.

Figure 9 is a fragmentary plan view of a vane with a stamped-out charge holder.

Figure 10 is a sectional view taken along the line 10—10 of Figure 9.

Figures 11, 12 and 13 are fragmentary plan views of sheet charges.

Figure 14 is a sectional view through a pair of vanes with auxiliary charge and fastening device.

Figures 15 and 18 are views similar to Figure 2 showing a modification of a charge holder.

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Figures 16 and 17 are views similar to Figure 14 showing modifications, and

Figure 19 is a plan view of a clip.

Referring to the drawing by characters of reference, there is shown in Figure 1 a tail piece 1 adapted to be threaded into a mortar projectile and carrying vanes 2. A unit of sheet charges 3 sewed or otherwise integrated as at 4 has a slit 5 which is slipped over the head or button 6 of a projection 7. The latter may be fastened to the tail 1 by means of a thin base 8 and upset portions 9, by screw threads 10 (Figure 3) or by soldering or riveting 11 (Figure 4). In Figure 5 is shown a holder fixed to the vane which comprises a series of barbed annuli 12. An ordinary screw thread will also accomplish a similar result. Instead of the solid projection 7 of Figure 2, a hollow eyelet may be employed, with outer end flared to form a head and the inner end crimped behind the tail piece, vane or other carrying member.

The button may also consist of a stamped-out portion 13 of the fin, having a head 14 (Figures 6 and 7), or a stamped-out portion 15 with perforation 16 for receiving a key member 17 (Figure 8).

While the charge-receiving buttons have been shown as located between the vanes, it will be understood that they may also be conveniently located on the faces of the vanes themselves.

In Figures 9 and 10 is shown a button formed by stamping radial tongues 13' from a vane 2, bending them perpendicular to the vane about the common center and forming loops 14' in their extremities to constitute a head for holding a charge.

A separate fastener 18 may be employed as shown in Figure 14. This fastener is simply inserted through the charge and vane and the ends bent back. The charge is held securely enough for handling, charging and firing and is easily removed if desired by pulling the charge and fastener from the vane. A spring type tong-like fastener 19 is shown in Figure 15 and in Figure 18 is shown a combination spring and screw type with spiral spring point 20.

The separate fastener may take the form of a single wire (Figure 19) bent to form a head 21. The shank 22 after being threaded through the charge and vane is bent as shown by the dotted lines to secure the assemblage.

The button may be carried by the charge and receive the vane as shown in Figures 16 and 17. In Figure 16, the fastener is shown as having a base portion 23 and a split shank or headed por-

tion 24 forming the button. This type offers some advantages over the vane carried projection because the holding action of the headed portion will be more rigid behind the metal vane than behind the charge. However, in all cases a compromise must be reached between the holding efficacy and ease of deliberate removal and each type may be appropriately designed for optimum performance.

In the fastener of Figure 17 a pin is split at both ends, one end being split sufficiently to form stapling arms 25 which are passed through the sheet charge and may take the place of the usual stitching. The other split end forms a contractile head 26, although the inner holding end may have any convenient form.

Figure 11 shows a sheet charge having crossed slits 5. In Figure 12, three slits 5 form a Y for easier insertion and removal. In Figure 13 a perforation 27 is provided for receiving a button.

From the foregoing it will be apparent that the invention comprises a means for fastening charges to projectiles which provides an optimum of security consistent with ease of placement and removal and is simple of manufacture and low in cost.

I claim:

1. In combination with firing components comprising a projectile and an external propellent charge therefor, a fastening member carried by one of said components and having a headed portion threaded laterally through the other of said components.

2. The combination as in claim 1 wherein said fastening member is carried by the projectile and the charge comprises a lateral opening for reception of the fastening member.

3. In combination with firing components comprising a projectile and an external propellent charge therefor, a fastening member carried by one of said components and having a contractile and expansible headed portion threaded laterally through the other of said components.

4. In combination with firing components comprising a projectile having a tail portion, a headed protuberance exteriorly on said tail portion for receiving and retaining thereon a propellent charge.

5. In combination with firing components comprising a projectile having a tail portion and guiding vanes carried thereon, a headed protuberance on at least one of said vanes for receiving and retaining thereon a propellent

charge, the protuberance adapted to extend through the charge.

6. In combination with firing components comprising a projectile having a tail portion, a protuberance threaded laterally into said tail portion and having a headed portion exteriorly of said tail portion for receiving and retaining thereon a propellent charge.

7. In combination with firing components comprising a projectile, a tail portion and a vane member thereon, a button on said vane member for attaching a propellent charge comprising radial struck portions bent outward about a common center and adapted to extend through the charge.

8. In combination with firing components comprising a projectile, a tail portion and a vane member thereon, a tang on said vane member comprising an outwardly struck portion, said tang having an enlarged portion spaced from the vane.

9. The combination as in claim 8, said tang having a T-form.

10. In combination with a projectile component having a perforation and an external propellent charge therefor having a perforation, a fastening member having a head and threaded through said perforations and having a bent retaining portion on the end opposite the head.

11. In combination, a propellent charge and an attaching member, said member comprising a headed portion fixed to said charge, a shank portion passing through said charge and fastening means on the end of the shank opposite the head for attachment to a projectile.

12. The combination as in claim 11 wherein said charge comprises a plurality of sheets and said attaching member comprises means for holding said sheets together.

13. In combination, a propellent charge comprising a plurality of sheets and an attaching member, said member comprising a headed portion, stapling means on said headed portion integrating said sheets, and a shank portion passing through said sheets and having means for attachment to a projectile.

14. In combination with firing components comprising a projectile and an external propellent charge therefor, a member carried by one of said components, protruding laterally therefrom and having means for receiving and holding thereon the other of said components.

ARTHUR ADELMAN.