PROJECTILE STORING AND TRANSPORTING STRUCTURE

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References Cited

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ABSTRACT

Projectiles are supported in parallel rows with the projectiles facing downwardly and having their tail portions spread apart. Each projectile is supported by a ring which extends around its largest diameter and an opening in a plate below the ring, the opening having its axis aligned with the axis of the ring. Each ring and opening pair supports a projectile with its axis at an oblique angle to the surface of a support plate to which the rings and plates in which the openings are formed, are secured. The arrangement is such that the topmost projectile of a vertical row is supported with its axis at a relatively small angle to the surface of the support plate, the next projectile is supported with its axis at a greater angle than the first projectile, etc., so the tail portions of the projectiles are spaced apart in fan fashion and are readily accessible. The rings to support successive projectiles of a row are spaced apart by a distance equal to the diameter of a ring. The support plate is provided with suitable straps to carry the storing and transporting arrangement on the back of a man like a knapsack.

7 Claims, 2 Drawing Figures
PROJECTILE STORING AND TRANSPORTING STRUCTURE

This invention relates to a structure or container for storing and transporting projectiles, particularly projectiles having tail fins and of the type used for grenade launchers and mortars.

Box like containers and frame structures are known in the prior art for the storing and transporting of projectiles of this type. These prior art containers usually include compartments defined by longitudinal and transverse walls or other partitions and into which compartment the grenades are inserted. A lid is customarily provided to close the container. In some of the prior art boxes or containers, the grenades are stored parallel to each other with their axes vertical, and in other prior art arrangements, the grenades lie in a horizontal position.

This invention relates to a unique arrangement for storing and transporting projectiles for grenade launchers and mortars which provides for easy loading and unloading of the projectiles, in which the projectiles are readily visible, and which can be readily carried by one man. A significant feature of the support structure is a pair of support rings, one of the rings surrounding the projectile at or near its largest diameter and the other ring surrounding the projectile at a location spaced from the first ring and supporting the projectile at or near the head or nose portion of the projectile. Advantageously, the first ring takes the form of a short hollow sleeve whereas the second ring takes the form of an aperture in a plate below the first ring. There are several vertical rows of such rings and the axes of the rings in each row lie in a common vertical plane. The several rings of each pair are secured to a support plate in such a manner that the axes of the rings extend obliquely relative to the surface of the support plate and the angle between the plate and the axes increases for successive pairs of the rings in a downward direction. Advantageously, for projectiles such as grenade launchers and mortar shells, the distance between the rings of each pair is approximately equal to the diameter of the larger first ring.

By virtue of this construction there is obtained a structure or framework for storing and transporting grenades in which the grenades are stored in a staggered fan like relationship relative to each other. The tail portions of the grenades are thereby slightly spread relative to each other so they may be easily and quickly grasped by their tail portions. By virtue of the increasing angles of inclination of the pairs of rings, each projectile is a predetermined vertical distance lower than the immediately above projectile. The framework or structure for supporting the grenades can be fixed in position on a vertical wall or similar support, or alternatively, the supporting plate can be provided with suitable straps to permit transporting the support in the manner of a knapsack.

A distinct advantage of the framework and structure of the grenade carrier according to this invention is that virtually any desired number of vertical rows can be provided simply by selecting a support plate of appropriate size and adding vertical row sections to the plate.

In the preferred embodiment the upper rings of each ring pair of a vertical row are supported in cantilever fashion from a location adjacent their upper ends. The plate in which the lower ring or aperture is formed also provides a support for the upper ring of the immediately beneath pair or support rings. This arrangement coupled with an increasing angle of inclination relative to the support plate for successively lower pairs of rings provides an inexpensive yet efficient framework and structure for carrying grenades and other projectiles with the tail portions spread apart to facilitate removal of projectiles from the support.

To protect grenades placed in the support, a flexible cover is placed over the loaded structure. Preferably, the flexible cover is sailcloth, although any other flexible durable material can be used for the cover. Suitable straps connected to the support plate readily adapt the structure for carrying by one person in knapsack fashion.

Numerous other features and advantages of the projectile storing and transporting arrangement according to this invention will become apparent with reference to the drawings, which form a part of the specification and in which:

FIG. 1 is a side view in elevation of the storing and transporting arrangement with the projectiles shown in phantom lines; and

FIG. 2 is a front view in elevation of the support of FIG. 1 with the cover removed.

Referring now to the drawings in detail and particularly to FIGS. 1 and 2, there is shown the structure or apparatus for storing and transporting projectiles in accordance with this invention. As shown, the structure includes a flat vertical support plate 1 which forms a rectangular base to which the remaining elements of the apparatus are secured. A plurality of holder rings 2-2b are secured to support plate 1 via intermediate connecting elements. Also secured to support plate 1 are a plurality of holder plates 5-5b having openings 3-3b formed therein respectively. As shown at FIG. 1, the apparatus is adapted to hold a plurality of projectiles such as grenades or mortar shells 6-6b at an oblique angle to support plate 1 with their tail portions 8 each above their nose portions 9.

With reference to FIG. 2, it will be seen that there are three vertical rows 10-12 of holder rings 2-2b and openings 3-3b in the preferred embodiment shown. Each of the rows 10-12 is identical in construction and additional rows may be added to increase the capacity of the storage and transporting apparatus. In such a case, plate 1 is made wider to accommodate the additional row or rows.

With reference to FIG. 1, it will be seen that holder ring 2 takes the form of a hollow cylinder or sleeve of relatively short axial height. Projecting from one side of the sleeve is a flange 13 by which the ring is secured to support plate 1 via an intermediate L shaped bracket 14 which is horizontally elongated. The connection includes suitable rivets 15 securing flange 13 to the obliquely extending leg of bracket 14, and rivets 15a securing the vertical leg 16 of the bracket to the support plate 1.

Holder plate 5 is also secured to support plate 1 via a vertical end leg 17 by suitable rivets 15a. Holder plate 5 is parallel with holder ring 2. End portion or leg 18 of holder plate 5 is bent downwardly at 4 at an angle to the body of plate 5 to provide a support for holder ring
3a. Below holder ring 2a is a second holder plate 5a having portions 19, 20 and 21 separated by bends 4a and 4b as shown at FIG. 1. The portion 19 of plate 5a is parallel with holder ring 2a. Extending between portion 19 of plate 5a and leg 18 of plate 5 is a brace plate 21a which provides additional support for the leg 18 where holder ring 2a is secured. Secured to the lower end portion 21 of plate 5a is a third holder ring 2b. By virtue of the bend at 4b, holder ring 2b extends at a different angle than the rings 2 and 2a relative to the surface of support plate 1 and the angle decreases for the respective rings 2–2a. Spaced from ring 2b is holder plate 5b which includes a first portion 22 separated from a second portion 23 at a bend 4c. Holder plate 5b has an upper vertical leg 24 which is secured to support plate 1 by rivets 15a. Extending between portion 22 of support plate 5b and portion 21 of support plate 5a is a brace plate 24.

As shown at FIG. 1, projectiles 6–6b have center lines or axes 25–27 respectively. The center line 25 coincides essentially with the axis of holder ring 2 and opening 3, the axis 26 coincides essentially with holder ring 2a and opening 3a, and the axis 27 coincides essentially with the axis of holder ring 2b and the axis of opening 3b. It will be observed with reference to FIG. 1 that the body of projectile 6 extends through ring 2 at its largest diameter 28. In addition, nose 9 of the projectile 6, extends through the opening 3 in holder plate 5a. Since the projectile tapers in a direction toward its nose, the outside of the projectile engages the sides of the opening along a circumference of the projectile. Hence, the opening 3 holds projectile 6 against downward movement whereas ring 3 encircles projectile 6 at its largest diameter 28 and prevents tilting movement of the projectile from the position shown at FIG. 1. Rings 2a and 2b and the openings 3a and 3b function similarly to hold projectiles 6a and 6b in the positions shown.

By virtue of the different angles of inclination of the respective rings 2–2b and the respective plates in which the openings 3–3b are formed, the angles of inclination of the axes 25–27 increase relative to the surface of support plate 1 for the respective projectiles 6–6b. In this regard, it will be noted that the axis 25 of projectile 6 makes an angle 30 of, for example, 20° with the front surface of support plate 1, axis 26 makes an angle 31 of, for example, 35° with the front surface of support plate 1. In addition, it is to be noticed that each of the rings 2–2a is spaced axially from the associated plates 5–5b by a distance d approximately equal to the diameter of one of the rings 2–2b. In addition, the distance from the axis of opening 3 at plate 5 to the axis of ring 2a is also equal to d, the diameter of a ring. The same relationship exists between opening 3a and ring 2b, as shown at FIG. 1. By virtue of this arrangement where the several rings and opening pairs 2–2b and 3–3b respectively are at different angles of inclination, and the axes 25–27 of the supported projectiles are correspondingly at different angles of inclination, the tail portions 8 of the projectiles are conveniently spaced apart to provide for ready removal of the projectiles from the respective ring and opening pairs.

With reference to FIGS. 1 and 2, it will be apparent that the axes of rings 2–2b and the openings 3–3b of row 10 lie in a common vertical plane perpendicular to the front surface of support plate 1. Rows 11 and 12 are identical to row 10. In addition, the rings 2–2b of the several rows 10–12 horizontally aligned with each other respectively, as are the openings 3–3b in the respective holder plates 5–5b.

By virtue of the construction described wherein holder plates 5a–5c are formed from, for example, sheet metal, and the rings 2–2b have a relatively thin wall and are, for example, also formed from relatively thin sheet metal, an apparatus for storing and transporting projectiles such as mortar shells is provided which is inexpensive to manufacture, yet relatively durable. While the several rings, 2–2b, holder plates 5–5b, and brace plates 21 and 24 are shown as secured together and to the support plate 1 by rivets, it is to be understood that these connections could be otherwise formed, for example, by spot welding where the several described elements are formed from sheet metal. Alternatively, at least some of these elements could be formed from a molded plastic material.

Extending from the lower portion 30 of support plate 1 in a direction downwardly and then upwardly around the projectiles and support structure is a flexible material enclosure which can take the form of a bag or cover 7. Cover 7 is advantageously formed from flexible material such as sail cloth or sheet plastic material. Cover 7 is of course provided with a suitable opening which can be closed with releasable fasteners (not shown) to enable rapid removal of the projectiles when they are needed immediately.

Secured to the rear face of support plate 1, are suitable straps 33 and 34 via which the assembly including the support plate, support structure, and the projectiles enclosed in the cover 7 can be carried on the back of a man like a knapsack. Alternatively, support plate 1 can be secured to the vertical wall of any desired implement or structure where it is merely desired to support projectiles temporarily or where the supporting wall is part of a mobile unit which can be transported to the site where the projectiles are needed.

While a preferred embodiment of the storing and transporting apparatus for projectiles has been described in detail, it is to be understood that numerous changes can be made without departing from the scope and spirit of this invention as set forth herein and as defined in the appended claims.

I claim:
1. A structure for storing and transporting projectiles comprising, in combination a generally vertical support plate;
the first projectile holder means carried by said support plate for holding a first projectile with its axis at a first angle of inclination relative to said support plate;
the second projectile holder means carried by said support plate for holding a second projectile below said first projectile and with the axis of the second projectile at a second angle of inclination relative to the support plate, said second angle being greater than said first angle;
said first and second projectile holder means each including
a first projectile holder element having an opening therein of a diameter to receive a projectile near its region of greatest diameter, and
a second projectile holder plate below said first element and spaced therefrom in a direction along the axis of the projectile and having an opening therein of a diameter smaller than the diameter of the opening in the first element to receive the projectile near its nose portion,
said first holder element of said second projectile holder means being attached to said second holder plate of said first holder means;
whereby, each projectile is supported at two locations.

2. A structure for storing and transporting projectiles according to claim 1 wherein
said arrangement further includes
third projectile holder means carried by said support plate for holding a third projectile at a location below said second projectile and with the axis of the projectile at a third angle of inclination to said support means, said third angle being greater than said second angle;
said third projectile holder means including
a first projectile holder element having an opening therein of a diameter to receive a projectile near its region of greatest diameter, and
a second projectile holder plate below said first element and spaced therefrom in a direction along the axis of the projectile and having an opening therein of a diameter smaller than the diameter of the opening in the first element to receive the projectile near its nose portion, said
first holder element of said third holder means being attached to said holder plate of said second holder means.

3. A structure for storing and transporting projectiles according to claim 2 wherein
brace means extend between to said holder elements and holder plates of at least said second and third holder means.

4. A structure for storing and transporting projectiles according to claim 1 wherein
said first holder element of each projectile holder means is a sleeve encircling the projectile near its region of greatest diameter.

5. A structure for storing and transporting projectiles according to claim 1 wherein
said structure further includes plural rows of said first and second projectile holder means; and
means securing said first and second projectile holder means of each row to said support plate.

6. A structure for storing and transporting projectiles according to claim 1 wherein
said support plate includes strap means to facilitate strapping the structure to the back of a man for carrying same in knapsack fashion.

7. A structure for storing and transporting projectiles according to claim 1 wherein
cover means extend around said projectiles and projectile holder means;
said cover means being formed from a flexible material; and
means connecting said cover means to said support plate.