United States Patent [19]

Tabor

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[45] **Jan. 22, 1974**

[54] **CONTAINER FOR EXPLOSIVE CHARGE**

[76] Inventor: **Patrick M. Tabor,** 101 S. LaSenda Dr., South Laguna, Calif. 92677

[22] Filed: **June 3, 1970**

[21] Appl. No.: **43,110**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 27,626, April 13, 1970, abandoned.

[52] **U.S. Cl.** ..... **220/63 R,** 89/36 R, 150/1, 206/3, 220/3, 220/83

[51] **Int. Cl.** **B65d 25/14**

[58] **Field of Search** 220/3, 83, 63; 206/3; 86/1; 89/1, 36; 109/26, 36, 37; 150/.5, 1

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Primary Examiner—William T. Dixson, Jr.
Assistant Examiner—Stephen P. Garbe
Attorney, Agent, or Firm—Lyon and Lyon

[57] **ABSTRACT**

There is disclosed herein a container within which explosives, such as bombs, can be placed and transported for disposal. An exemplary container may be considered as essentially an elastic container, and is substantially cylindrical with an arcuate bottom and formed from a number of laminations of suitable material, such as fiberglass. A support member is provided in the container for holding the explosive charge from intimate contact with the container. The support member may be in the form of a net suspended in the container, foam material within the container, or the like. The structure of the container is such that if the bomb explodes the container delaminates rather than breaking apart in the form of flying fragments.

7 Claims, 7 Drawing Figures

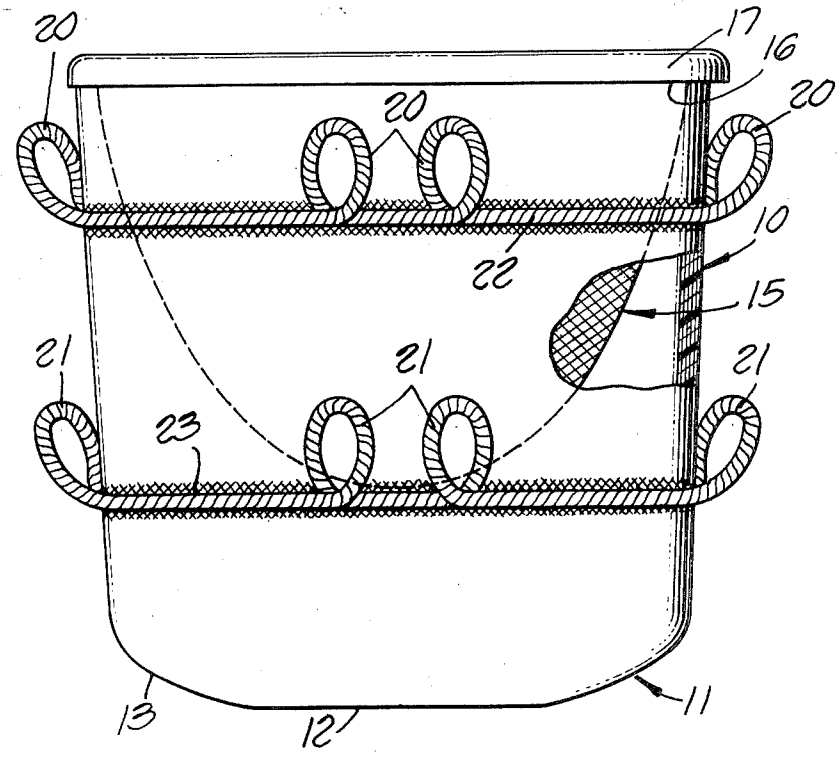


FIG. 1.

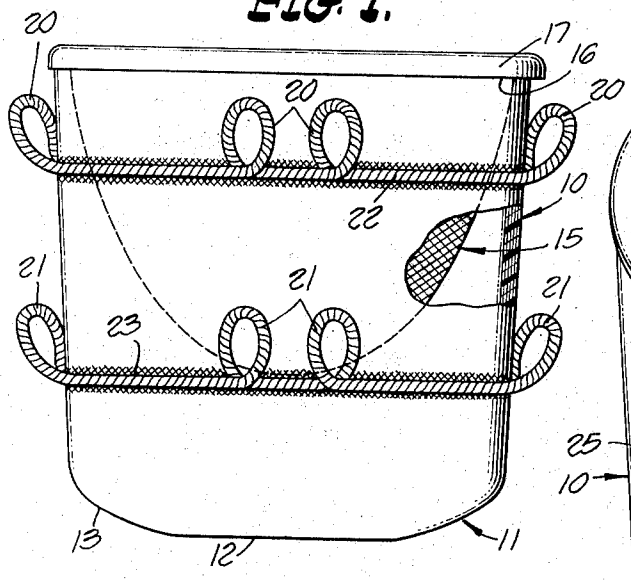


FIG. 2.

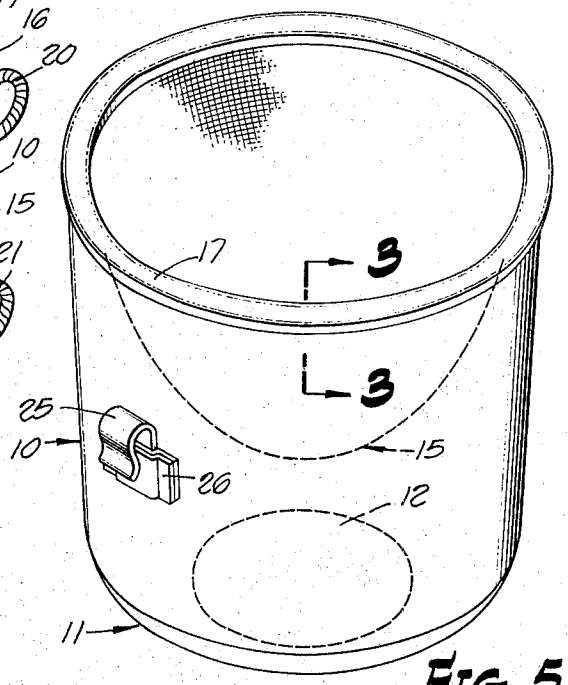


FIG. 4.

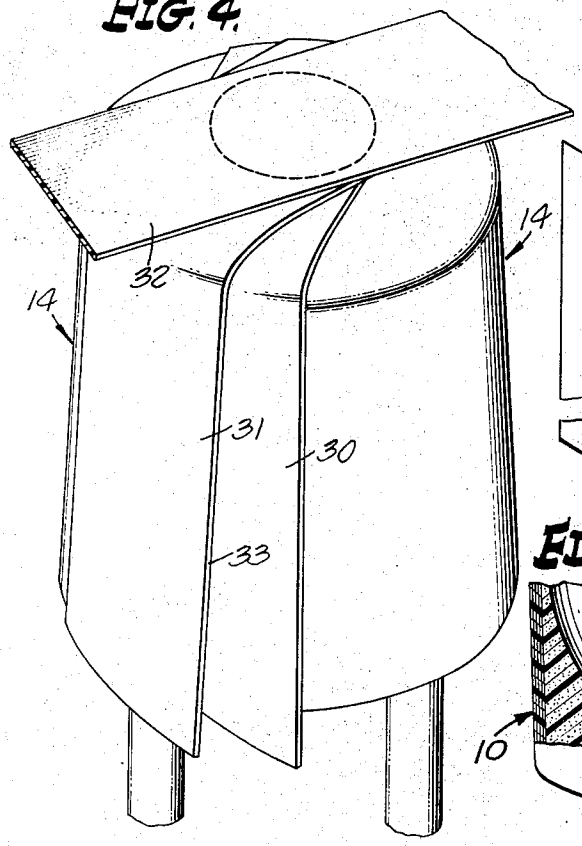


FIG. 6.

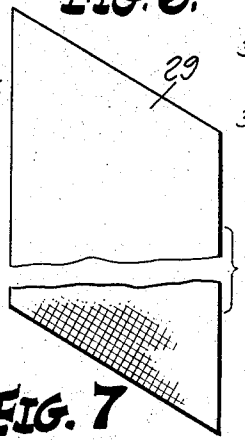


FIG. 5.

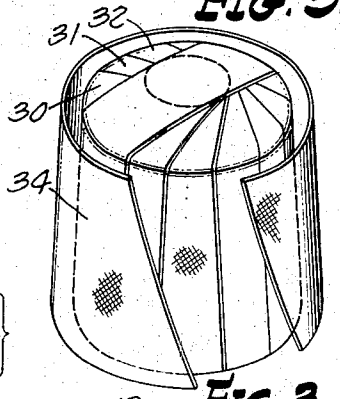


FIG. 7

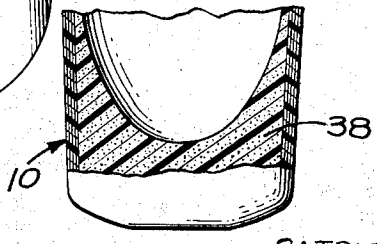
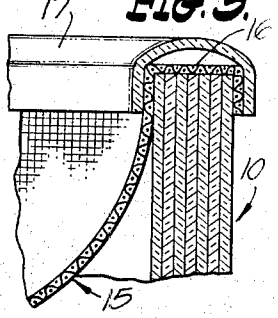


FIG. 3.



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CONTAINER FOR EXPLOSIVE CHARGE

This application is a continuation-in-part of my copending application entitled "Container For Explosive Charge," U.S. Pat. Ser. No. 27,626, filed Apr. 13, 1970, now abandoned, (Lyon & Lyon Docket No. 131/208).

This invention relates to the art of explosive disposal, and more particularly to a container in which an explosive charge may be transported and detonated relatively safely.

The disposal of explosives, such as bombs, is extremely hazardous and requires great care and expertise on the part of the individuals involved. Usually, protective garments are worn which are cumbersome and make handling of the explosive charge somewhat awkward. The explosive is placed in a type of container which, in the event the charge prematurely detonates, can create flying fragments resulting in substantial danger to surrounding persons and equipment.

The present invention is directed to a novel container into which an explosive charge may be placed, and transported and detonated relatively safely. Accordingly, it is a principal object of the present invention to provide a new container for an explosive charge.

An additional object of this invention is to provide a laminated container construction including supporting means therein for supporting an explosive charge within the container.

Another object of this invention is to provide a novel laminated container and supporting means for supporting an explosive charge within the container but out of intimate contact with the container.

A further object of this invention is to provide a bomb disposal container of laminar construction which tends to delaminate in the event of detonation of the bomb.

These and other objects and features of the present invention will become better understood through a consideration of the following description taken in conjunction with the drawing in which:

FIG. 1 is an elevational view, partly in section, of a container according to the present invention;

FIG. 2 is a perspective view of the container of FIG. 1, but with a modified handle arrangement;

FIG. 3 is a cross-sectional view taken along a line 3—3 of FIG. 2;

FIGS. 4 and 5 are views illustrating the manner in which a container is formed;

FIG. 6 is a view of material used in forming the container; and

FIG. 7 is a cross-sectional view of the container with an alternative supporting means.

Briefly, in accordance with the concepts of the present invention, a container is provided within which an explosive charge can be supported, the container being so constructed as to absorb the forces upon detonation of the charge. An exemplary container is substantially cylindrical and has an arcuate bottom which may be said to form a diaphragm. A net, or other suitable support, is hung from the upper rim of the container and provides a support for the explosive charge within the container but out of contact with the container. Alternatively, the support can be in the form of plastic foam, foam rubber, cardboard, or the like within the lower part of the container to keep the charge out of contact with the container. The container is a laminated construction, such as from ballistic fiberglass. Upon detonation of the explosive charge, the bottom and side walls of the container tend to delaminate rather than the material fragmenting or shattering. Because of this action, the force of the explosive can be suitably absorbed, and restrained to an upward direction without any significant danger to surrounding personnel or equipment. A typical example container is approximately 27 inches in diameter and 27 inches deep, although different shapes and sizes may be used. A container of this nature layed up of 24 ounce fiberglass woven roving with nine laminations has been used in successfully containing a five stick charge of 40 percent blasting gelatin.

Turning now to the drawing, FIGS. 1 and 2 illustrate a container according to the concepts of the present invention. The container is substantially in the form of a cylindrical wall 10 and an arcuate bottom 11 having a substantially flat portion 12 and an arcuate section 13. The side cylindrical wall 10 of the container flares outwardly slightly, such as by approximately 3°, to provide draft for removing the container from a mold 14 illustrated in FIG. 4 and which will be described subsequently. A net 15, of nylon or other suitable material, is suspended from the top rim 16 of the side wall 10 of the container and extends downwardly to about one-third the height of the container from the bottom thereof. An exemplary container is approximately 27 inches high and 27 inches in diameter and, thus, the bottom of the net 15 is approximately nine inches from the bottom of the container in this case. The net is maintained on the upper rim 16 of the container by means of a plastic strip 17 as best seen in FIG. 3.

The container is formed of a number of layers or laminations of material, such as ballistic fiberglass, in a manner to be described subsequently. A suitable handle or handles may be provided on the exterior of the wall 10. In FIG. 1, handles are formed by loops 20 and 21 of respective ropes 22 and 23. The ropes 22 and 23 are secured to the periphery of the container by resin used in laying up the container, with the loops 20 and 21 hanging free. A suitable tool can be hooked into the loops for dragging the container. The arcuate configuration of the bottom of the container also aids in dragging the container. For example, a person pulling the container may hook a rope or rod into loop 21, and a person following may restrain the container with a rope or rod hooked in an upper loop 20 for dragging the container along a floor or even down stairs. Alternatively, a plurality of hooks, such as a hook 25 in FIG. 2, of material similar to that of the container may be secured to the periphery of the container by an additional layer or layers of material and resin, such as indicated at 26 in FIG. 2.

As an example of the construction of a suitable container, the same may be formed by laying up a number of sheets of 24 ounce fiberglass woven roving, such as that distributed by Thalco Company of Santa Ana, Calif., and made by Uniglass Industries, a Division of United Merchants, Shelby, N.C. Pieces 29 of the woven roving approximately 12 inches wide as illustrated in FIG. 6 are cut on a bias and laid in a flower-petal configuration on a form or mold 14 as seen in FIG. 4. As can be seen from FIG. 4, the first three pieces 30 through 32 have been placed on the mold 14 with each being off-set by one-half its width. That is, the edge 33 of the piece 31 lies about midway between the edges of

the piece **30**, and so forth. After several such pieces have been laid in this manner, a circular band **34** is wrapped around the assembly as illustrated in FIG. **5**. The sequence of laying the elongated pieces such as **30–32** and then encircling them with the circular band, **34** performed three times resulting in essentially nine laminations, although only seven are shown in FIG. **3** for simplicity of illustration. The resin is applied in a conventional manner, and any suitable resin may be used, such as polyester resins identified as Koppers 60–60–5 or Diamond Schamrock 6631. Unidirectional roving can be used but it is more difficult to handle than the woven roving.

Alternative supporting structures, rather than the net **15** or in addition thereto, can be used. FIG. **7** is a view of the container **10** with the bottom portion thereof filled with a non fragmenting material **138**, such as plastic foam or foam rubber. The purpose of the support is to maintain the explosive charge out of intimate contact with the container and preferably in about the center of the container, but the support should be of a lightweight material which will not significantly fragment upon detonation of the charge. Thus, other supports, such as a cardboard platform or table, may be used instead of the net **15**.

In the use of a container according to the present invention, the explosive charge is placed in the net **15** or other suitable support meeting the criteria set forth above, and the container transported to a disposal location. Forceps or similar devices may be used to pick up the charge and place it in the container. The container can be suspended when the charge is detonated. Upon detonation of the explosive charge, it has been found that the container at least partially delaminates rather than fragmenting. The container retains its laminar characteristic inasmuch as the fiberglass is stronger than the bonding agent, thus allowing the laminations to separate in absorbing the explosive forces. This delamination soaks up alot of force. The structure is thus a resilient structure rather than a strong rigid structure, and the bottom thereof is in a sense springy. The container may be considered to be a plastic spring formed in a suitable shape which does not fragment or shatter under explosive concussion, along with a support which functions to maintain the charge out of intimate contact with the interior of the container.

As another alternative, one container (with a supporting means) may be nested within another and arranged with a space between the two containers to accommodate larger explosive charges. Furthermore, a laminated container as described herein may be lined on the inside with a metal, such as titanium or steel, or a ceramic material. This arrangement is useful for high speed explosives which generate fragments that travel faster than those from typical homemade bombs. In this case, the outer laminations prevent the liner from fragmentation.

The present embodiments of this invention are to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims therefore are intended to be embraced therein.

What is claimed is:

1. A container for facilitating disposal of an explosive charge comprising

a body terminating in a bottom at one end, said body being formed of a plurality of laminations of resilient material which upon detonation tend to delaminate rather than fragment, and

support means mounted within said body for supporting an explosive charge out of intimate contact with the interior of said body, said support means being a net coupled with a second end of said body.

2. A container for facilitating disposal of an explosive charge comprising

a body terminating in a bottom at one end, said body being formed of a plurality of laminations of resilient material which upon detonation tend to delaminate rather than fragment, and

support means mounted within said body for supporting an explosive charge out of intimate contact with the interior of said body, wherein said body is substantially cylindrical and said bottom is arcuate, said body and bottom being formed of a plurality of layers of balistic fiberglass and resin, said support means being a net coupled with a second end of said body.

3. A container for facilitating disposal of an explosive charge comprising

a body having a first closed end and a second open end, said body being substantially cylindrical and said first end being arcuate, said body being molded of a plurality of laminations of ballistic material and a bonding agent, and

support means mounted within said body, the lower extremity of said support means extending downwardly to approximately one-third the height of said body to maintain a charge out of intimate contact with said body.

4. A container as in claim **1** wherein

said support means is of substantially non-fragmenting material.

5. A container as in claim **3** wherein

said ballistic material is fiberglass and said bonding agent is resin.

6. A container as in claim **5** including

handle means in the form of arcuate members secured to the periphery of said body for facilitating transporting of said container.

7. A container for facilitating disposal of an explosive charge comprising

a body having a first closed end and a secured substantially open end, said first end being arcuate, said body being molded of a plurality of laminations of fiber glass and a polyester resin, and

support means mounted within said body, the lower extremity of said support means extending downwardly to approximately one-third of the height of said body to maintain a charge out of intimate contact with said body.

* * * * *

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,786,956 Dated January 22, 1974

Inventor(s) Patrick M. Tabor

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In The Claims:

Column 4, line 40, change "1" to --3--.

Column 4, line 52, change "secured" to --second--.

Signed and sealed this 21st day of May 1974.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents

FORM PO-1050 (10-69)

USCOMM-DC 60376-P69
☆ U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334

UNITED STATES PATENT OFFICE
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FORM PO-1050 (10-69)

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