April 26, 1955 G. J. KESSENICH 2,706,949

DEMOLITION UNIT

Filed March 8, 1950

Fig. 1.

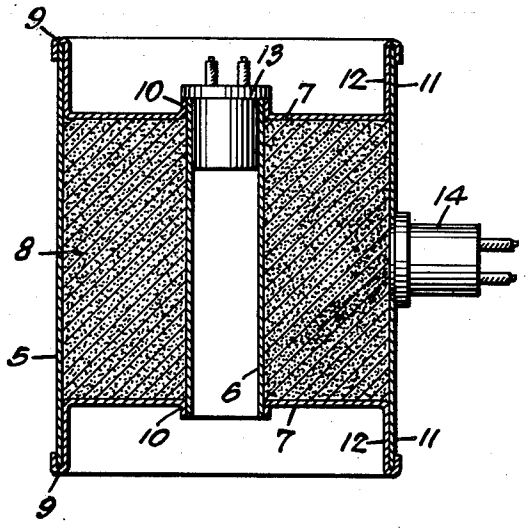


Fig. 2.

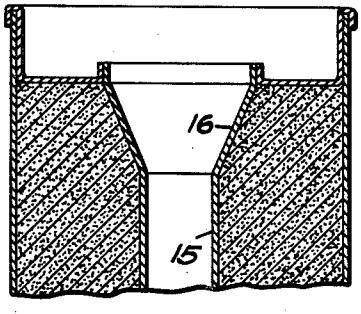
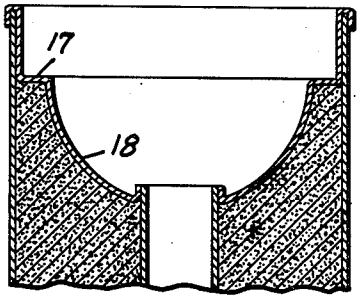


Fig. 3.



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DEMOLITION UNIT

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Application March 8, 1950, Serial No. 148,443

1 Claim. (Cl. 102—24)

(Granted under Title 35, U. S. Code (1952), sec. 266)

The invention described in the specification and claims 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 a demolition unit of the petard type in which an explosive charge is used to perforate or penetrate a barrier.

The cavity effect of explosives was noted by Baader in Norway in 1790 and since that time this phenomenon has been the subject of considerable investigation. In Van Nostrands Engineering Magazine, vol. 31, July–December 1884, Von Forster shows a cavity extending entirely through the charge.

United States patent to Mims 1,582,184 discloses the idea of lowering a solid cylindrical charge into a well casing and directing the force of the charge to perforate or burn through the casing. Patents 2,399,211 and 2,494,256 combine with Mims the well-known cavity effect of explosives.

The purpose of this invention is to provide a convenient arrangement of a cavity explosive charge which will facilitate its application and use under a wide variety of situations.

Several embodiments of the invention are illustrated in the accompanying drawings, in which:

Fig. 1 is a vertical sectional view of a container constructed in accordance with the invention.

Figs. 2 and 3 are fragmentary vertical sectional views of modifications thereof.

The container is of metallic or nonmetallic material and is similar to that shown in my prior Patents 1,973,717 and 2,044,004. It comprises outer and inner spaced walls or casing members **5** and **6** and identical end closures **7—7** all cooperating to form an annular chamber containing the explosive charge **8** which surrounds the axial passage formed by the wall **6**. The outer joint **9** and the inner joint **10** may be formed and sealed in any approved manner but as in the patents the marginal portions **11** and **12** of the outer wall and end closures cooperate to form a flange projecting beyond the end closures and thereby providing a striking gap or standoff when the container is placed against a barrier.

Initiation of the explosive charge may be provided for from either one or two positions depending on the action desired. It may be provided axially by an initiator **13** placed in either end of the tube formed by the inner wall

6 or by an initiator **14** arranged centrally of the container.

In the form of container shown in Fig. 2 the opposite ends of the inner wall **15** are flared outwardly to define a conical end **16**. The shape of this portion may be varied as is well understood in the art. In the form of invention shown in Fig. 3 the end closure **17** is countersunk with a recess or cavity **18**, in this instance hemispherical.

When an explosive charge in the form shown is to be used without being encased in a container it is desirable to coat its exterior surfaces with a protective material.

In operation the inner wall **6** constitutes a liner for a shaped charge of explosive and will give the cavity effect. The inner wall forms an axial passage whereby the container may be hung on a nail protruding from a barrier that is to be blasted or perforated. A cord or wire inserted through the passage may be used to suspend the container in position to be fired or to carry a large number of the containers.

I claim:

An explosive demolition unit comprising inner and outer tubular cylindrical casing members, said inner casing member having a diameter and length less than the corresponding dimensions of said outer casing member, a pair of cup-shaped end closures each forming a part of a spherical surface and each having a snug fit within a respective end of said outer casing member to form a re-entrant end surface therefor each said end having a central perforation in its bottom of the same diameter as said inner casing member and in which a corresponding end of said inner casing member fits and is secured, whereby said casing members are united in coaxial nested symmetrical relation, the rims of each said cupped end closure being secured to a corresponding end edge of said outer casing member, an explosive charge filling the enclosed space defined by and between said casing members and said end closures, and a detonator for said explosive charge removably fitting within one end only of said inner casing member.

References Cited in the file of this patent

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2,044,004	Kessenich	June 16, 1936
2,147,565	Warburton	Feb. 14, 1939
2,416,077	Yuster	Feb. 18, 1947
2,494,256	Muskat et al.	Jan. 10, 1950

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Von Foster, "Van Nostrand's Engineering Magazine," vol. 31, July–December 1884, 102/HC, pages 113 to 119 and Plates I and II. (Copy in Scientific Library.)

Birkhoff et al., "Journal of Applied Physics," vol. 19, No. 6, June 1948, 102/HC, pages 563 to 582. (Copy in Scientific Library.)

Lawrence, "The Explosives Engineer," November–December 1947, 102/HC, pages 171 to 173, 182 and 183. (Copy in Scientific Library.)