March 1, 1938. W. GIBBONS 2,109,479

GRENADE AND METHOD OF MAKING THE SAME

Filed Sept. 29, 1937 2 Sheets-Sheet 1

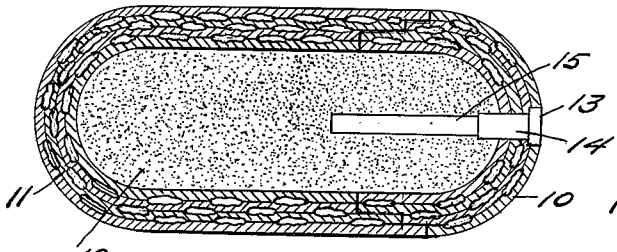


Fig. 1.

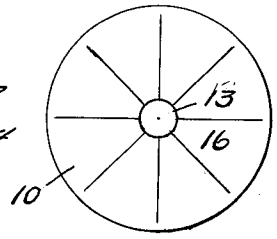


Fig. 2.

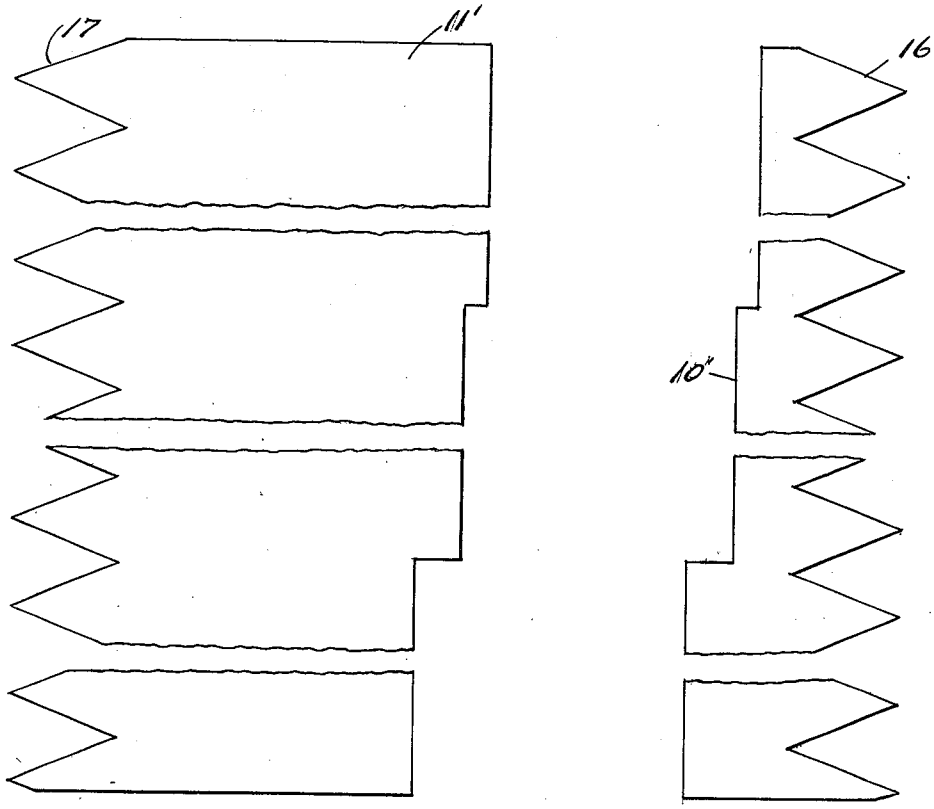


Fig. 3.

Inventor
Wayne Gibbons
By Adam Richmond
Attorney

March 1, 1938. W. GIBBONS 2,109,479

GRENADE AND METHOD OF MAKING THE SAME

Filed Sept. 29, 1937 2 Sheets-Sheet 2

Fig. 4.

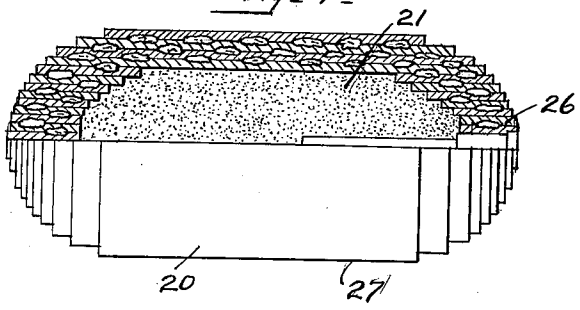
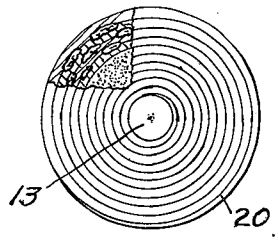


Fig. 5.



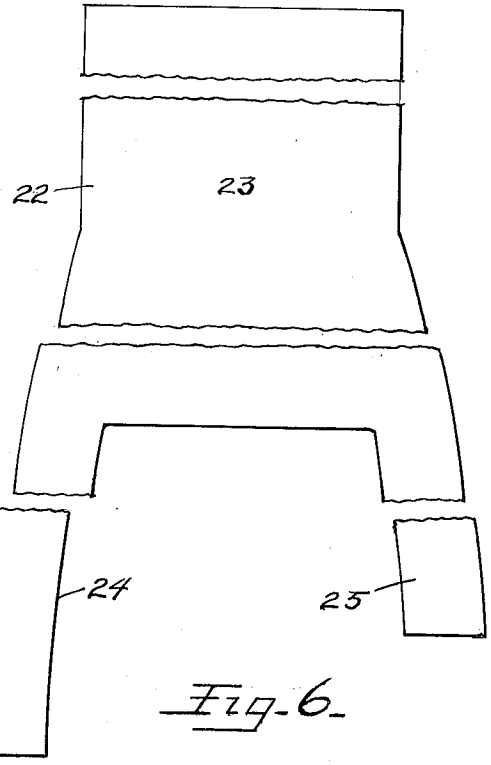


Fig. 6.



Fig. 8.



Fig. 7.

Inventor
Wayne Gibbons
By Adam Richmond
Attorney

Patented Mar. 1, 1938 2,109,479

UNITED STATES PATENT OFFICE

2,109,479

GRENADE AND METHOD OF MAKING THE SAME

Wayne Gibbons, Camp Custer, Mich.

Application September 29, 1937, Serial No. 166,343

8 Claims. (Cl. 102—29)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

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 generally to grenades, but more particularly to a grenade formed with laminated paper and the method of making the same.

One object of the invention is to provide a grenade which may be easily and economically manufactured.

Another object of the invention is to provide a grenade which ruptures more readily than the types now used and one which, due to its construction, requires less explosive to produce the same effect.

Referring more particularly to the accompanying drawings in which corresponding parts are indicated by similar reference characters:

Fig. 1 is a central longitudinal partially sectionized view of the grenade;

Fig. 2 is an end elevation of the grenade, shown in Fig. 1;

Fig. 3 is a plan view showing, the form of the two sections of the paper envelopes which enclose the central core of the grenade;

Fig. 4 is a longitudinally partially sectionized view of a modified form of the grenade;

Fig. 5 is a partially sectionized end elevation of the grenade shown in Fig. 4;

Fig. 6 is a plan view showing the form of the paper envelope which enclose the central core in the modified form of grenade shown in Figs. 4 and 5;

Fig. 7 is a sectionized view showing one method of imbedding the shrapnel between the laminations of paper enclosing the central core of the grenade and

Fig. 8 is a sectionized view showing another method of imbedding the shrapnel between the laminations of paper enclosing the central core of the grenade.

Briefly stated, the grenade is formed of paper rolled about a core of explosive material provided with a fuse assembly, shrapnel being imbedded between the laminations enclosing said central core.

Referring to Fig. 1, the numeral (10) indicates the lid portion of the grenade housing or shell which retains the fuse assembly and (11) the body portion of the shell into which the lid portion fits, the two portions enclosing a central core of explosive (12). The fuse assembly consists of a cap (13), a primer (14) and a fuse (15).

Referring to Figs. 2 and 3, illustrating the contour of the sheets of paper or other fibrous material (10') and (11'), which are rolled to form the two portions of the shell enclosing the central core (12) of the grenade, it will be noted that the edges which form the semispherical ends of the grenade are cut to form a number of tapered projections (16) and (17) which may be bent inward toward the center line of the grenade to more readily adapt themselves to the contour required.

The two portions of the shell (10) and (11) are formed by rolling the sheets (10') and (11') around a form (not shown) pasting one layer upon another, and interspersing pieces of shrapnel between the laminations previous to pasting them together. This method of forming the grenade gives a wall construction which is illustrated in Figs. 1 and 7, in which shrapnel is interspersed between every layer of paper forming the housing of the grenade.

Another method by which the grenade may be constructed is to paste two or more layers of identical contour together, after having interspersed a layer of shrapnel between them, and then roll the double or multiple layers upon a form (not shown) in the same manner as above described. This method of forming the grenade gives a wall construction as illustrated in Fig. 8, in which the shrapnel is interspersed between every other layer of paper forming the housing or shell of the grenade.

In the modified form of improved grenade shown in Figs. 4 and 5, the shell (20) surrounding the central core (21) is formed completely by rolling the paper form (22), as shown in Fig. 6, upon itself and pasting the laminations together as the rolling progresses. For forming this type of grenade the paper which forms the circular side wall and ends is cut to a contour as illustrated in Fig. 6, in which the central body portion is indicated by the numeral (23) and the portions which form the ends of the grenade by (24) and (25) respectively.

It will be noted in Fig. 6 that the end portion (24) is longer than the end portion (25) which allows extra material for completely closing the end of the grenade which is not provided with the fuse assembly passage (26). In wrapping the paper to form the shell which surrounds the central core the sections (24) and (25) are first rolled upon themselves and pasted together. After these end portions are rolled, a fractional turn of the portion (23) is completed sufficient to retain the charge of explosive which is in-

serted to form the core and the wrapping continued until the circular side wall (**20**) is completed.

The fuse assembly may be rolled into the housing as described above or inserted after the housing is completed. In the latter case the central charge may be inserted through the passage (**26**) left for the insertion of the fuse assembly instead of putting it into the grenade before completion of the circular side wall.

Having described my invention, what I claim as new and wish to secure by Letters Patent is:

1. A method of making grenades, comprising an explosive core, a fuse assembly and a shell, including the following steps—circularly winding a sheet of paper upon itself, interspersing shrapnel between said windings and adhesively connecting the adjacent surfaces of said sheet while winding the same, inserting the explosive core and fuse assembly.

2. A method of making grenades, comprising an explosive core, a fuse assembly and a shell including the following steps—interspersing shrapnel between sheets of paper, adhesively connecting the adjacent surfaces of said paper, circularly winding the adhesively connected sheets upon themselves, adhesively connecting the adjacent surfaces of the laminations while winding the same, and inserting the explosive core and fuse assembly.

3. A method of making grenades, comprising a core, a fuse assembly and a shell, including the following steps—circularly winding a sheet of paper upon itself, inserting the explosive core and fuse assembly before the completion of the first winding, interspersing shrapnel between said windings and adhesively connecting the adjacent surfaces of said sheet while winding the same.

4. A method of making grenades, comprising a core, a fuse assembly and a shell including the following steps—interspersing shrapnel between sheets of paper, adhesively connecting the adjacent surfaces of said paper, circularly winding the adhesively connected sheets upon themselves, inserting the explosive core and fuse assembly before the completion of the first winding, and adhesively connecting the adjacent surfaces of the laminations while winding the same.

5. A method of making grenades having an explosive core, a fuse assembly and a shell having a body portion and a lid portion, comprising the following steps—forming each portion of the shell from strips of paper having a serrated edge and an opposite stepped edge, winding said strips upon themselves, interspersing shrapnel between said windings, bending the serrations of said edges centrally to form end closures, and adhesively connecting the adjacent surfaces of the respective sheets while winding the same, inserting the central explosive core and fuse assembly and uniting the end and body portions of said grenade.

6. A method of making grenades having an explosive core, a fuse assembly and a shell, comprising the following steps—forming a sheet of paper to a contour which when wound upon itself will be adapted to form the body and end portions of the shell, winding said sheet upon itself, interspersing shrapnel between said windings, adhesively connecting the adjacent surfaces of the sheet while winding the same, and inserting the explosive core and fuse assembly.

7. A grenade comprising a central explosive core and fuse assembly surrounded by laminated paper interspersed with shrapnel between its adjacent layers.

8. A grenade comprising a central explosive core and a fuse assembly encircled by layers of paper adhesively connected about a central layer of shrapnel and adhesively united throughout the extent of the winding.

WAYNE GIBBONS.