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MEANS FOR INITIATING EXPLOSION

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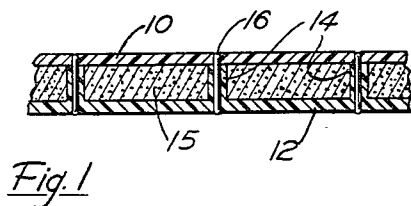


Fig. 1

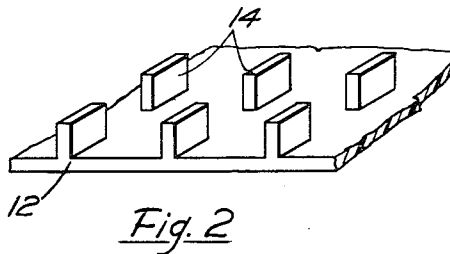


Fig. 2

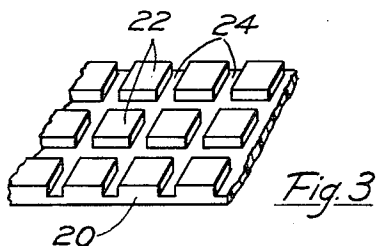


Fig. 3

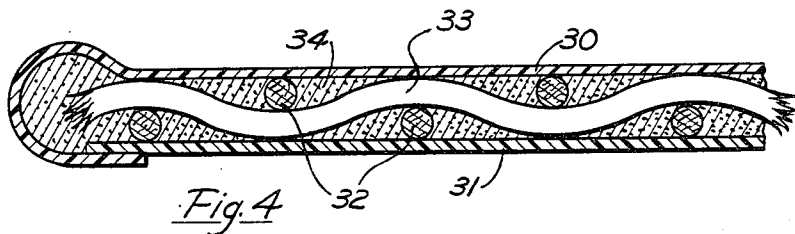


Fig. 4

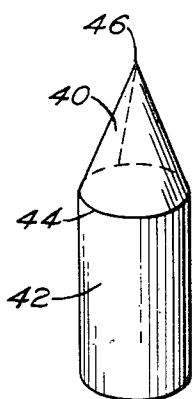


Fig. 5

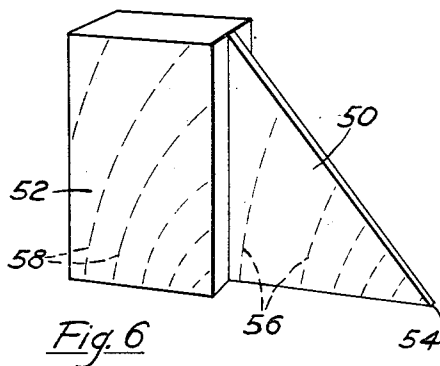


Fig. 6

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MEANS FOR INITIATING EXPLOSION

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1 Claim. (Cl. 102—70)

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

This invention relates to explosives, and more particularly to means for initiating an explosion in a mass of high explosive. The invention contemplates the provision of a material in sheet form, capable of propagating a detonation wave from a point of initiation to a plurality of points along a straight or curved line at the mass of high explosive which it is desired to detonate.

The sheet material of the present invention is preferably formed of a lattice or network of relatively inert material, having interconnecting interstices which are filled with explosive material capable of propagating a detonating wave. The opposite surfaces of the sheet may be covered by inert material, making the sheet capable of being readily handled, stored and formed into convenient shapes for use.

An object of the invention is to provide a relatively inexpensive sheet material propagating a detonation wave in such manner as to detonate a mass of high explosive connected thereto.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following description.

Fig. 1 is a view in cross section of a sheet embodying the invention;

Fig. 2 is a view in perspective of an element forming part of said sheet;

Fig. 3 is a view similar to that of Fig. 2, but showing a modified form of element;

Fig. 4 is a view in cross section of a modified form of sheet; and

Figs. 5 and 6 are views in perspective showing the sheet material as applied in different ways to the detonation of a mass of high explosive.

In the form of the invention shown in Figs. 1 and 2, the sheet comprises a lamina or sheath 10 of relatively inert material such as molded nylon, cardboard, or metal. A second sheet 12 which may be of similar inert material is mounted in predetermined spaced relation to the sheet 10 by means of spacers 14 which may be formed integral therewith. The interstices between the spacers 14 are filled with a uniform layer of material 15 such as lead azide, capable of propagating a detonation wave. In assembling the sheet, the high explosive, preferably in plasticized form, is spread evenly upon sheath 12, and sheath 10 is then pressed down upon the mass and held in place by its adhesion to the explosive or by mechanical means such as staples 16. The spacers 14 accurately control the sheet thickness to insure uniform characteristics throughout. Such a sheet may be used for the simultaneous initiation of several detonators, which may be connected to the sheet at spaced points.

The form of sheath 20 shown in Fig. 3 may be substituted for the sheath 12 of Figs. 1 and 2; it is formed with massive blocks 22 of inert material which form a grid occupying the greater portion of the space between the two sheaths, leaving relatively narrow intersecting passageways 24 to be filled with explosive 15, the required amount of which is correspondingly reduced.

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In the form of the invention shown in Fig. 4, the grid or lattice between the sheaths 30 and 31 is formed by the warp and woof 32, 33 of a textile fabric such as canvas, which is impregnated by a plasticized explosive as indicated at 34. The interstices of the fabric thus form continuous paths, filled with explosive, along which a detonation wave may be propagated. A selvage may be formed on the sheet by extending the sheath 30 and folding it into contact with sheath 31, as shown. If this is done at all of the edges, the explosive is completely protected from contamination, fraying, or ignition by sparks or the like.

In the arrangement shown in Fig. 5, a portion of a sheet such as described above has been cut to segmental shape, bent into the form of a cone 40, and secured by adhesive or otherwise in contact with a mass of high explosive 42 which is cylindrical in form with its upper circumference coinciding with the base of the cone along a circle indicated at 44. If detonation is initiated at the apex 46 of the cone, the wave front will proceed downwardly at uniform rate until it reaches the circle 44, so that explosion of the mass 42 will be initiated simultaneously at a plurality of points along said circle, as is desirable in many cases. Alternatively, a conical sheet such as that shown at 40, properly designed in angle of axis and velocity of detonation, may be used separately to produce a flat shock wave, which is useful in producing signals in materials for purpose of tests. It can also be used over mine fields for detonation of land mines, over earth to destroy living organisms, at night (along with illuminating materials such as magnesium if desired) to produce rapid illumination over large areas, and to produce excessive sound effects in possible attack techniques against personnel.

In the form shown in Fig. 6, a triangular portion 50 of the sheet material is secured at one edge to a mass 52 of high explosive. If detonation is initiated at the free apex 54 of the sheet, it will generate successive wave fronts in the sheet as indicated at 56, and in the mass as indicated at 58, which is desirable in some instances.

In all of the several forms of the invention, the sheet material may be detonated in usual manner by a fuze applied at an appropriate point, as at the edge of the sheet material shown in Figs. 1-4, or at the points 46 and 54 in Figs. 5 and 6.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claim the invention may be practiced otherwise than as specifically described.

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

What is claimed is:

65 A device for propagating a detonation wave, comprising a sheet formed of spaced sheaths of flexible plastic, spacing members between said sheaths forming a network of interconnecting interstices, and flexible explosive material filling said interstices and forming a plurality of separate paths interconnected at a plurality of points along their length for propagation of a wave front.

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