

[54] **HEAVY-DUTY WIRE-NET STRUCTURE**
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[51] Int. Cl. **B66c 1/12**
[58] Field of Search **245/1-9; 294/77; 5/186 R, 186 B, 191, 354; 55/487, 525; 256/45**

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[57] **ABSTRACT**
A wire-net structure for heavy-duty use comprises a rectangular mesh of diagonally intersecting wire elements framed by a peripheral cable passing through a set of eyes on each side of the rectangle, the wire elements including a multiplicity of straight ropes paralleling one diagonal direction and a continuous meandering cable with sections paralleling the other diagonal direction. The straight ropes are anchored to the eyes traversed by the peripheral cable whereas the meandering cable engages only the ropes, being looped about some of those at bight portions interconnecting its diagonally extending sections. For use as a blasting mat, several of which may be tied adjacent one another around a conduit in danger of rupture, the meshing wire elements slide freely past one another; for other uses, e.g. as a cargo net, they may be fixedly interconnected at their intersections.

4 Claims, 3 Drawing Figures

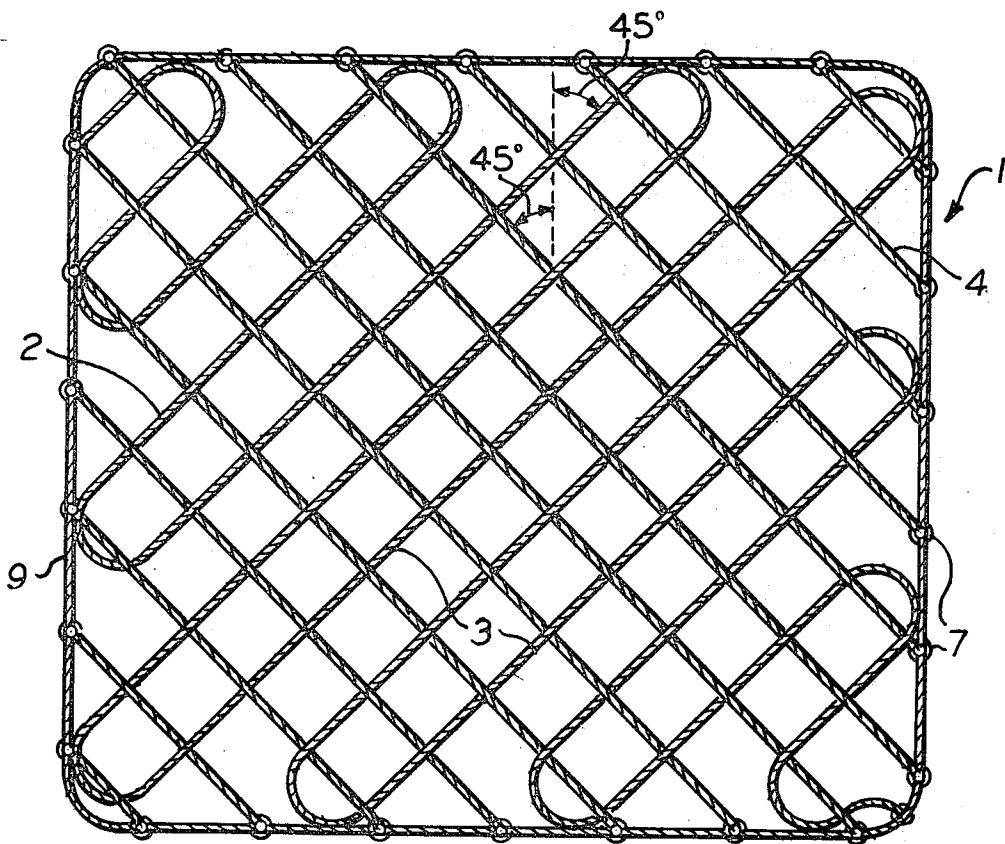


FIG. 1.

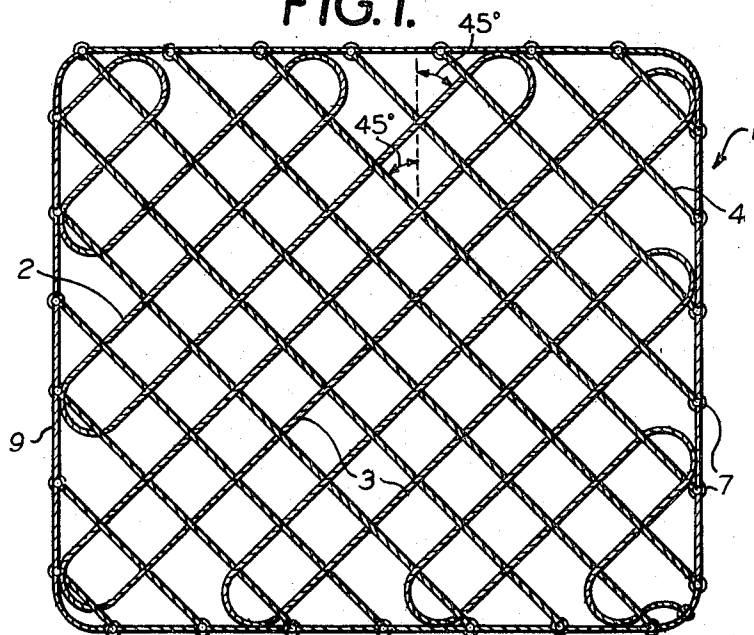


FIG. 2.

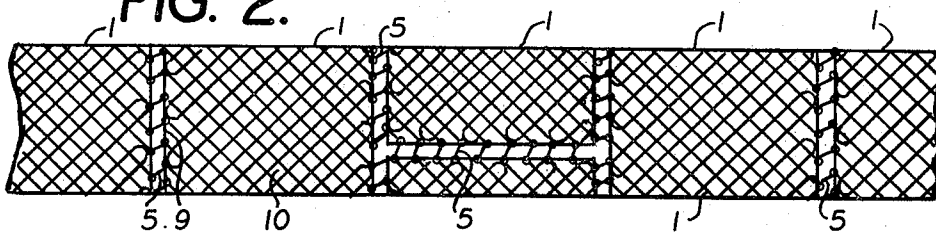
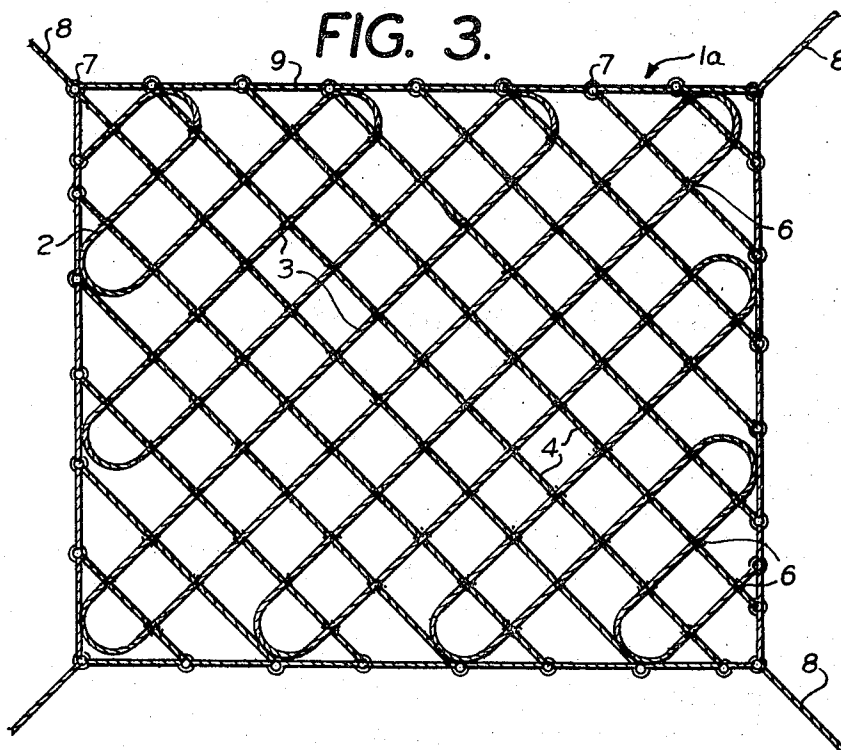


FIG. 3.



HEAVY-DUTY WIRE-NET STRUCTURE

The present invention relates to a wire-net structure for heavy-duty use, e.g. as a blasting mat or a cargo net.

Blasting mats are used to resist explosive forces and to effectively protect surrounding objects from flying debris and damping subsequent detonation waves while preventing the spreading of blast particles.

Blasting mats have generally been made of rigid material to offer unyielding resistance to explosive forces. These mats are uneconomical, large and unsatisfactory.

Blasting mats have also been made of resilient material comprising a plurality of heavy rubber-tire pieces threaded with flexible wire-rope loops to yield to excessive blasting forces. A compressed blasting shield of twisted, tangled scrap wire is also known, as well as explosion guards of plies of wire netting, slit sheet metal or steel wool.

None of the known blasting mats have the ability to prevent breaking of tubing such as, for example, nuclear conduits and to tighten therearound in the event of forces causing a rupture thereof.

Accordingly, it is one object of the present invention to provide a blasting mat which can be used to surround a conduit and upon breaking thereof tightens therearound, containing the break.

It is another object of the present invention to provide basic wire-net structure adapted to serve as a blasting mat or, alternately, as a cargo net.

A further object of our present invention is to provide a blasting mat, sized to be applied about heat-exchanger conduits such as, for example those used in nuclear installations, capable of preventing an explosion or break from spreading, holding the conduit firm, and tightening during the explosion, and confining a rupture due to an explosion to the break area while retaining the broken ends of the pipe or conduits.

In accordance with the present invention we provide a rectangular, preferably square frame supporting a mesh of substantially diagonally oriented wire ropes. The purpose of the net is to hold in place the conduit on both sides of the break.

If a suitably dimensioned mat in accordance with the present invention is to be used as a cargo net, the wire ropes are joined together as by welding, tying or riveting at the crossing points. For this purpose, hooks may be used for the wire ropes, or the ropes may be formed with such hooks.

The wire-net structure according to our invention comprises short parallel lengths of cable extending parallel to one diagonal and a single continuous cable meandering in a direction parallel to the other diagonal without directly engaging the frame.

For surrounding conduits or pipes with an exact fit, the mat edges paralleling the conduit axis are closely spaced and interconnected throughout their length, without overlapping, by wires, hooks, clamps, wire-rope fittings or other fastening means.

An assembly of interconnected, endwise adjoining mats according to our invention may be used to surround, support and contain a variety of objects with a firm grip when an explosion, rupture or the like occurs.

With the above and other objects in view which will become apparent in the following detailed description, the present invention will be described in further detail with reference to the accompanying drawing in which:

FIG. 1 is a top plan view of a mat embodying the present invention;

FIG. 2 is a side elevation of a conduit enveloped by an assembly of several mats as shown in FIG. 1; and

FIG. 3 is a top plan view of a modified mat according to our invention, adapted for use as a cargo net.

As shown in FIG. 1, a substantially square mat in accordance with the present invention is made of cables or wire rope comprising one continuous wire cable 2, meandering in one diagonal direction and having sections 3 substantially parallel to one another, and a plurality of parallel lengths of wire rope 4 in another diagonal direction, substantially perpendicular to the cable sections. Thus, the elements making up the net of FIG. 1 include angles of approximately 45° with the mat edges. The wire elements 3 and 4 cross alternately under and above one another in intermeshed relationship, freely permitting relative sliding. The shape of the mat is preserved by a peripheral cable 9 passing through eyes 7 to form a frame to which the wire elements 3 and 4 are anchored. Cable 9, it will be noted, is connected by the eyes 7 to the mutually parallel ropes 4 but is not engaged by the continuous cable 2 whose sections 3 are interconnected by bight portions looped around some of the straight ropes 4.

A plurality of such mats can be disposed adjacent one another along and about a conduit 10 to be protected.

As shown in FIG. 2, the wire nets of these mats are connected to one another by fastening means 5 here shown as hooks or clamps engaging the eyes 7 (cf. FIG. 1). The interconnected mats are identical in size and have a length equal to the outer circumference of the conduit; they fit without overlapping around the conduit 10 and, as shown for the middle mat in FIG. 2, have edge seams not aligned with those of adjoining mats.

In the event of a localized explosion or break in the conduit, the assembly will tend to expand only adjacent the breaking area and, as a result of the ability of the crossing wire ropes to move freely past one another, a tightening of the assembly occurs equally in all directions about the conduit, holding the conduit firm, resisting breaking of the conduit at other portions, as well as confining and holding intact the broken parts of the conduit at the break area. The equalization of stresses in the affected mat is particularly due to the 45° orientation of the wire ropes as well as the square shape thereof.

Other rectangular shapes and diagonal orientations provide greater tightening forces in predetermined directions, which may be required for particular applications where breaking forces tend to predominate in certain directions.

The diameters of the wire ropes 3 and 4 are of a size sufficient to sustain the required or expected forces.

In FIG. 3 we have shown a mat 1a designed for use as a cargo net for transportation and lifting purposes. The wire ropes 3 and 4 are joined together as by welding, tying or riveting at the crossing points 6 so as not to permit relative movements. The mat 1a may be larger than the mat 1 shown in FIG. 1. Eyes 7 at the corners may be used for connections, such as lifting cables 8, serving to tie the frame 9 to hoists for raising and lowering the cargo net 1a.

While we have disclosed several embodiments of the present invention, it is to be understood that these em-

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bodiments are given by way of example only, and not in a limiting sense.

We claim:

1. A wire-net structure comprising:
a generally rectangular frame;
a multiplicity of first wire elements anchored at their ends to said frame, said first wire elements extending substantially parallel to one diagonal of the rectangle defined by said frame; and
a continuous cable of meandering configuration with sections substantially parallel to the other diagonal of said rectangle, said sections constituting second wire elements intermeshed with said first wire elements, said continuous cable being secured to said frame only through said first wire elements.
2. A wire-net structure as defined in claim 1 wherein

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said frame comprises a peripheral cable and a set of eyes traversed by said peripheral cable on each side of the rectangle, said first wire elements being tied to said eyes.

- 5 3. A wire-net structure as defined in claim 1 wherein said continuous cable has bight portions looped about certain of said first wire elements, said first and second wire elements being freely slidable relatively to one another at their points of intersection.

- 10 4. A wire-net structure as defined in claim 3 wherein said frame is bent into tubular shape with opposite edges closely spaced from each other, further comprising fastening means interconnecting said closely spaced
15 opposite edges.

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