

March 6, 1945.

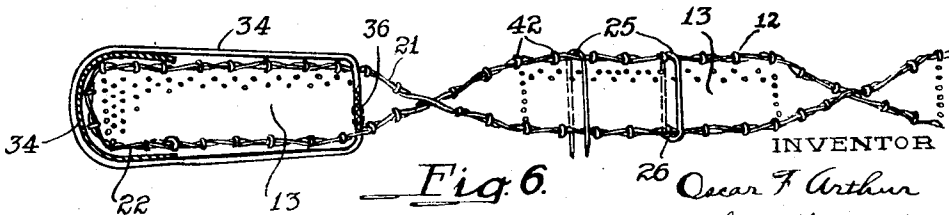
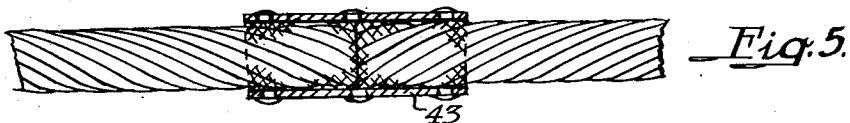
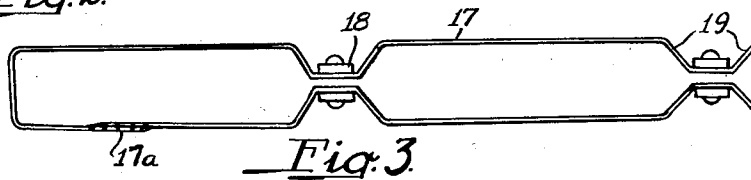
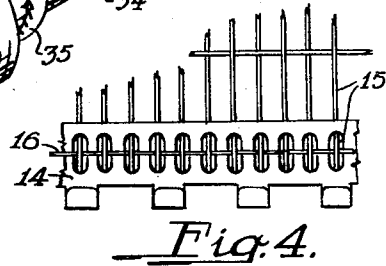
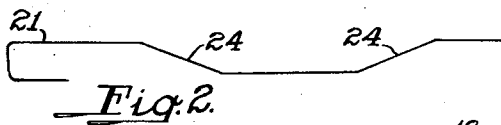
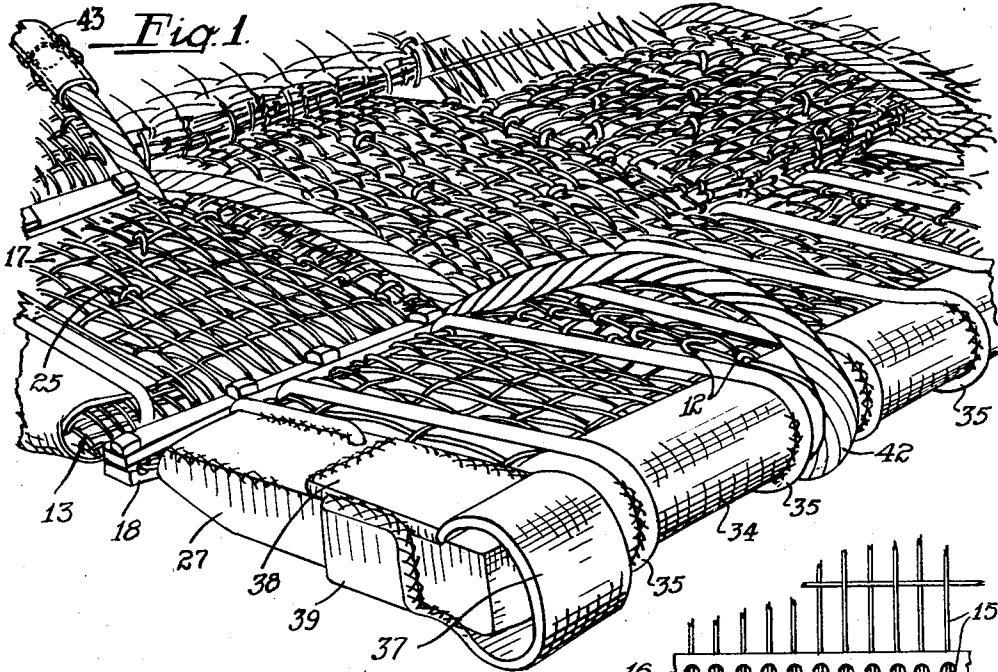
O. F. ARTHUR

2,371,017

MAT

Filed Aug. 3, 1943

3 Sheets-Sheet 1



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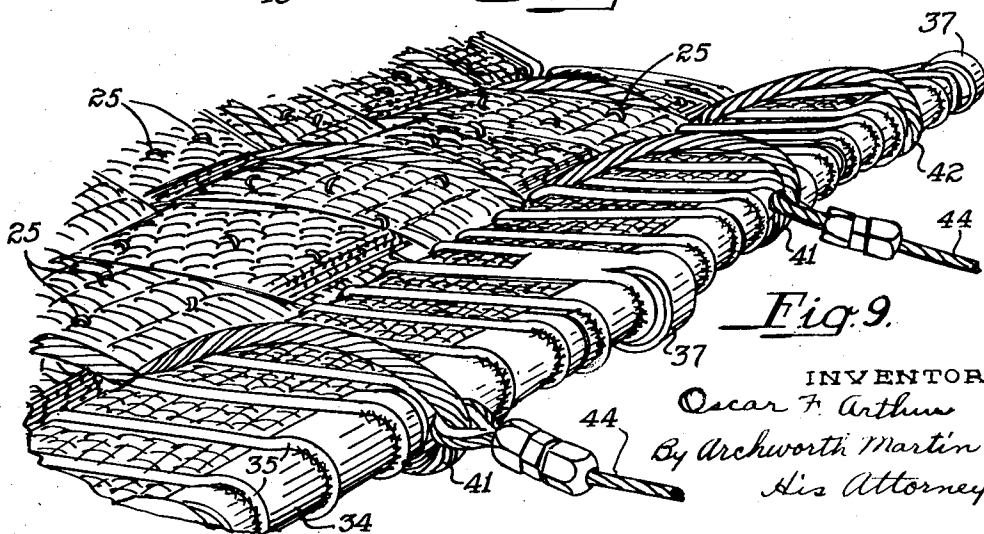
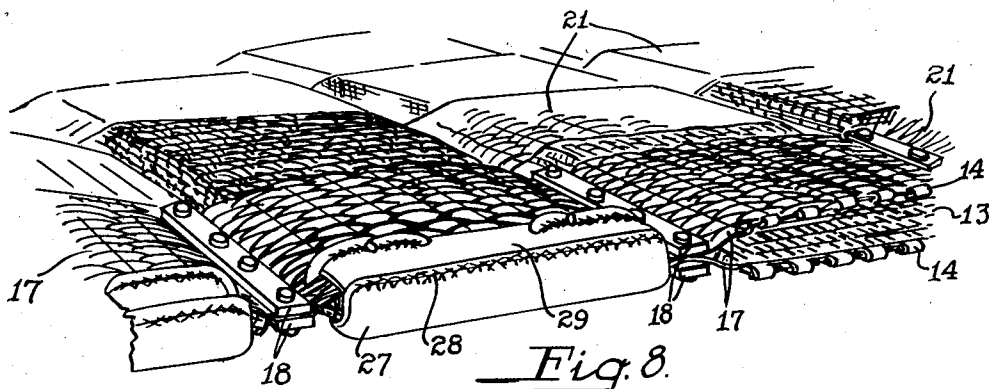
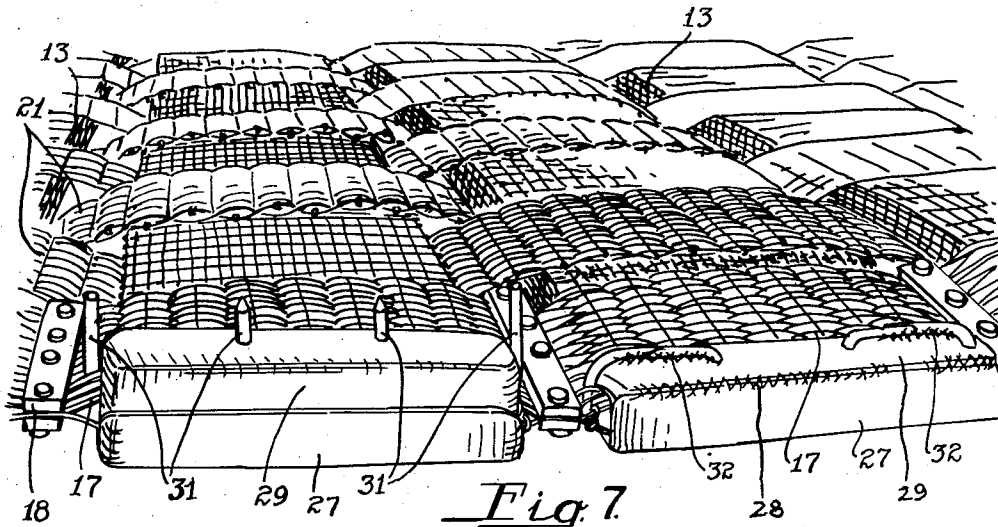
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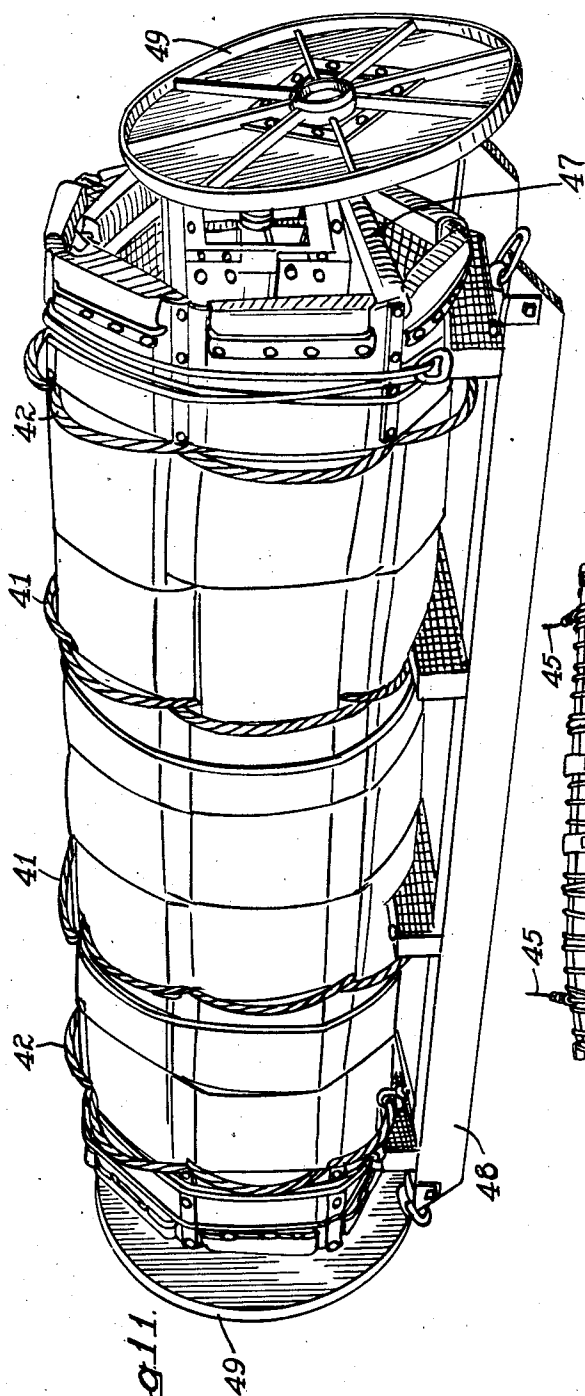


Fig. 11.

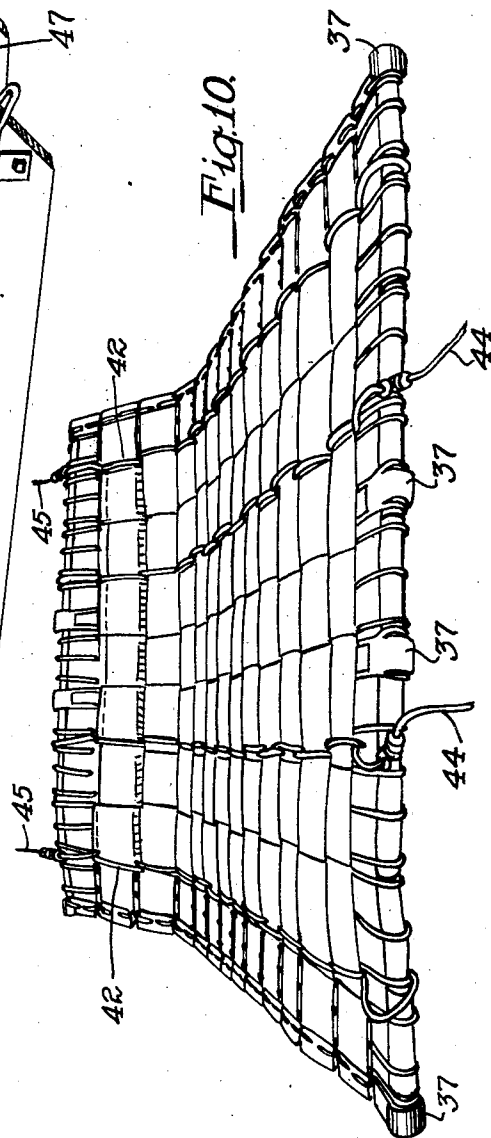


Fig. 10.

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UNITED STATES PATENT OFFICE

2,371,017

MAT

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Application August 3, 1943; Serial No. 497,169

10 Claims. (Cl. 94-4)

My invention relates to mats, and more particularly to mats of wire mesh that are especially suited for use as landing mats and beach aprons, to facilitate transfer of vehicles, etc., from ship to shore, or from landing barges. The mat is also intended for use on swampy or sandy ground, to serve as a support for vehicles and machinery, to prevent sinking thereof, as well as being suitable for various other uses such as bomb shelters.

One object of my invention is to provide a mat which, although it is sufficiently massive and strong to support equipment of great weight such as tractor tanks, steam shovels, etc., and to withstand bombs, it can nevertheless be conveniently transported and placed in position.

Another object of my invention is to provide a mat of the character referred to which has great strength, for the weight of the material employed therein, and which will not readily become so deformed as to be unfit for use.

One form which my invention may take is shown on the accompanying drawings, wherein Figure 1 is a fragmentary perspective view of a mat, at one corner thereof; Fig. 2 shows a manner in which certain of the longitudinal mesh bands are preformed; Fig. 3 indicates the manner in which the longitudinal bands at the edges of the mat are arranged; Fig. 4 shows the manner in which tie plates are connected to certain of the transverse mesh bands; Fig. 5 is an enlarged view, showing the manner in which the cables that are woven through the mat are spliced or connected at their ends; Fig. 6 is a longitudinal sectional view through a portion of the mat at one end thereof; Fig. 7 is a fragmentary perspective view of the mat, showing a portion of the connecting means for the longitudinal and transverse bands at a longitudinal edge of the mat; Fig. 8 is a similar view showing certain of the bands exposed at an edge of the mat, before and after the application of protecting boots thereto; Fig. 9 is a perspective view showing a portion of one end of the mat in completed condition, with pull cables applied thereto; Fig. 10 is a perspective view showing a completed mat, on a reduced scale, and Fig. 11 shows a manner in which the mat may be rolled and mounted for transport.

The mat comprises wire mesh bands arranged in multi layers and partially interwoven after the manner of a basket weave. Each band is shown as comprising strand and stay wires that are interwoven to form a mesh, as shown for example in my application Ser. No. 461,099, filed October 7, 1942, (Patent 2,361,163) the stay wires

having their ends bent backwardly around the marginal longitudinal wires, at each edge of the band, as indicated at 12 in Figs. 1 and 6.

The transversely-extending bands are arranged in groups wherein the bands of each group are placed in superposed relation, as shown more clearly at 13 in Figs. 6 and 8. The uppermost and lowermost transverse bands of each group have stiffening and anchoring plates 14 connected thereto as shown more clearly in Fig. 4, the strands of these bands having crimps or bends 15 formed therein and extending through slots in the plates 14, a lacing wire or rod 16 being inserted between the bends and the plates to complete the laced connection. These plates are welded to boots as will hereinafter be explained.

Longitudinal bands are connected to the groups of transverse bands. At the longitudinal edges of the mat, longitudinal bands 17 overlie and underlie the transverse groups at 13. A single band 17 may be provided at each edge of the mat, looped back with its ends welded together as at 17a, or upper and lower bands can be provided instead of a single band 17. In any case, longitudinal layers will be clamped together at points between each transverse group of bands 13, by clamping plates 18 that are bolted or riveted together. While the wires comprising the various transverse and longitudinal bands preferably will be of hard drawn wire or spring steel, so that they will not easily become bent in use or in handling, I pre-shape the bands somewhat by forming bends 19 therein (Fig. 3) to facilitate alignment and proper spacing of the transverse bands 13 in assembling the mat.

Intermediate longitudinally-extending bands 21 are passed over and under the groups of transverse bands 13 alternately, after the manner of a basket weave. Thus, as shown more clearly in Fig. 7, one band 21 will pass under and over the groups of transverse bands 13, successively, while an adjacent longitudinal band 17 will be passed across opposite faces of these transverse bands, to form the basket weave referred to. As shown in Fig. 6 each band 21 may be bent back at its ends as indicated at 22, and welded to the adjacent groups of strands 13. These bands 21 may likewise be preformed somewhat as indicated at 24 to facilitate positioning or alignment of the bands during assembly thereof.

The bands 13 are also connected to bands 17 and 21 by staples or loops 25 which are driven or pressed through the layers of mesh at various points, the ends of these staples being bent into

parallelism and welded together as indicated at 26 in Fig. 6.

Metal boots are provided at the longitudinal edges of the mat. These boots each comprises an L shaped plate 27 whose lower leg extends under the mat, with its vertical leg welded at 28 to a top plate 29. U shaped rods 31 extend upwardly through the lower leg of the member 27 and through the layers of mesh, as shown more clearly in Figs. 7 and 8. One leg of each member 31 extends through a hole in the top plate 29. The legs are then bent into parallelism with one another and welded to the top plate and to one another, as shown at 32. Also, the plates 27 and 29 are welded to the plates 14 at the ends of the upper and lower transverse bands. These welds, together with the staples, bind the bands firmly together against displacement under weight or impacts imposed on the mat.

Boots 34 are provided at the ends of the mat, being welded to rods 35 that are bent to looped form around the endmost groups of bands 13 and their ends welded together at 36 (Fig. 6). Loops or eyes 37 having upper and lower extensions 38 and 39 welded to the mat serve as runners to facilitate sliding of the mat along a supporting surface.

Certain of the longitudinal bands 17 are spaced apart a sufficient distance to permit lacing or weaving of cables 41 and 42 above and below the transverse groups of bands 13. Each of these cables may be a single piece with its ends joined by welding in a metal sleeve 43 (Fig. 5). At one end of the mat, the cables 41 will suitably be connected to pull ropes or cables 44 and at the other end of the mat the cables 42 will be similarly connected to pull ropes 45 (Fig. 10). The cables 41 and 42 serve as a convenient means for anchoring the mat and also for pulling it from place to place. These cables at various points are bowed outwardly from the plane of the mat, a sufficient distance that they serve somewhat as runners to facilitate shifting of the mat and to prevent tearing of the mesh wires. Also they relieve the longitudinal bands of pulling stresses when the mat is being towed or is stretched.

Because of the spacing between the groups of bands 13 at transverse lines where the clamping plates 18 are located and where each band 17 passes from the upper side of one transverse group to the lower side of the next transverse group, the mat will bend readily, thus having flexibility, and it can be wrapped around a drum or frame 47 (Fig. 10) for convenient transport. It can then be placed on a sled or skid 48; or wheels or drum disks 49 of greater diameter than the rolled mat can be bolted to the ends of the drum 47, so that the mat can be transported by rolling it along the ground.

Each transverse group of bands 13 is in effect a relatively stiff panel that will withstand great weights without permanent deformation, and at the same time its flexible connection by the longitudinal bands, with the other transverse groups, imparts to the mat as a whole a desirable flexibility which renders it adaptable to uneven or non-planular surfaces, thereby further reducing the danger of strained distortion of the mat under loads.

I claim:

1. A mat comprising transversely-extending bands of flexible material arranged in groups of superposed bands that are spaced apart longitudinally of the mat, flexible longitudinally-extending bands each of which extends alternately above

and below successively arranged transverse groups and across the spaces between the groups, the longitudinal bands being spaced apart transversely of the mat and engaging that face of each group which is opposite to the face that is engaged by an adjacent longitudinal band, and means for securing the transverse and longitudinal bands in assembled relation, at the ends and edges of the mat, the said means comprising shoes partially embracing the said ends and edges, the shoes at the mat edges being spaced apart longitudinally of the mat, at points between the said groups.

2. A mat comprising transversely-extending bands of flexible material arranged in groups of superposed bands that are spaced apart longitudinally of the mat, flexible longitudinally-extending bands some of which are placed above and others below the said groups and bridging the spaces between the groups, and means for securing each upper longitudinal band to an adjacent lower band, at points between the said groups.

3. A mat comprising transversely-extending bands of flexible material arranged in groups of superposed bands that are spaced apart longitudinally of the mat, longitudinal bands of flexible material lying against the upper and lower faces of the said groups and bridging the spaces between the groups, and shoes embracing the ends of each group and secured thereto, the shoes being relatively spaced longitudinally of the mat.

4. A mat comprising transversely-extending bands of flexible material arranged in groups of superposed bands that are spaced apart longitudinally of the mat, longitudinal bands of flexible material lying against the upper and lower faces of the said groups and bridging the spaces between the groups, shoes embracing the ends of each group and secured thereto, and cables of relatively stiff material looped around the ends of the mat and laced through the spaces between the groups, in each direction relative to the plane of the mat and bowed outwardly from said plane at zones between said spaces.

5. A mat comprising transversely-extending bands of flexible material arranged in groups of superposed bands that are spaced apart longitudinally of the mat, longitudinally-extending flexible bands each of which extends alternately above and below successively arranged transverse groups and across the spaces between the groups, a longitudinally-extending flexible band disposed above and one below the said groups, along each edge of the mat and bridging the spaces between the groups, and means for securing the last-named bands together at each edge of the mat, at points between the groups.

6. A mat comprising transversely-extending bands of flexible material arranged in groups of superposed bands that are spaced apart longitudinally of the mat, longitudinally-extending flexible bands each of which extends alternately above and below successively arranged transverse groups and across the spaces between the groups, longitudinally-extending bands disposed above and below the said groups, along each edge of the mat and bridging the spaces between the groups, and clamping devices securing the last-named bands together at points between the said groups.

7. A mat comprising transversely-extending bands of mesh material, spaced apart longitudinally of the mat, longitudinally-extending bands of mesh material arranged in woven relation with the transverse bands, and cables of rela-

tively stiff material looped around the ends of the mat and laced through the spaces between the transverse bands, in each direction relative to the plane of the mat and bowed outwardly from said plane at zones between said spaces.

8. A mat comprising transversely-extending bands of mesh material, spaced apart longitudinally of the mat, longitudinally-extending bands of mesh material arranged in woven relation with the transverse bands, and cables of relatively stiff material looped around the ends of the mat and laced through the spaces between the transverse bands, in each direction relative to the plane of the mat and bowed outwardly from said plane at zones between said spaces, the cables being disposed between adjacent edges of the longitudinal bands.

9. A mat comprising transversely-extending bands of material that are spaced apart longitudinally of the mat, flexible longitudinally-extending

ing bands some of which are placed above and others below the transverse bands and bridging the spaces between the transverse bands, and means for securing each upper longitudinal band to an adjacent lower longitudinal band, at points between the said groups.

10. A mat comprising transversely-extending bands of material that are spaced apart longitudinally of the mat, flexible longitudinally-extending bands some of which are placed above and others below the transverse bands and bridging the spaces between the groups, and flexible cables of relatively stiff material extending longitudinally of the mat, the cables bowed outwardly from the plane of the mat at zones between the points where the transverse bands are spaced apart and extending toward the mid plane of the mat at said points.

OSCAR F. ARTHUR.