N. E. CLARK.

EXPANDED METAL FABRIC.

APPLICATION FILED APR. 14, 1919.

1,437,746. Patented Dec. 5, 1922.

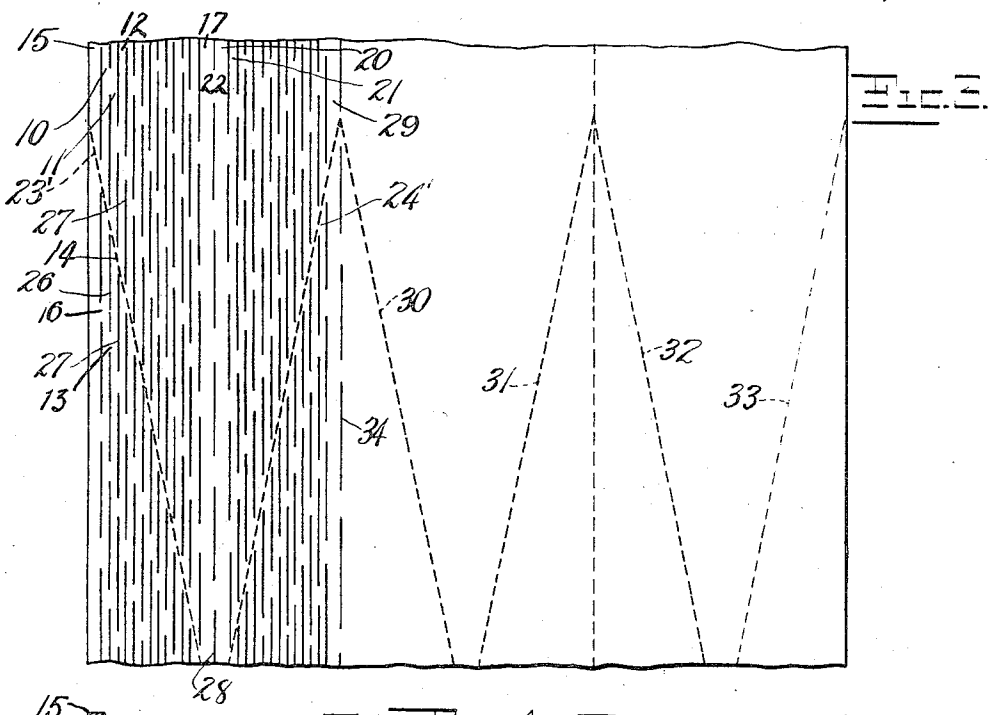


Fig. 3.

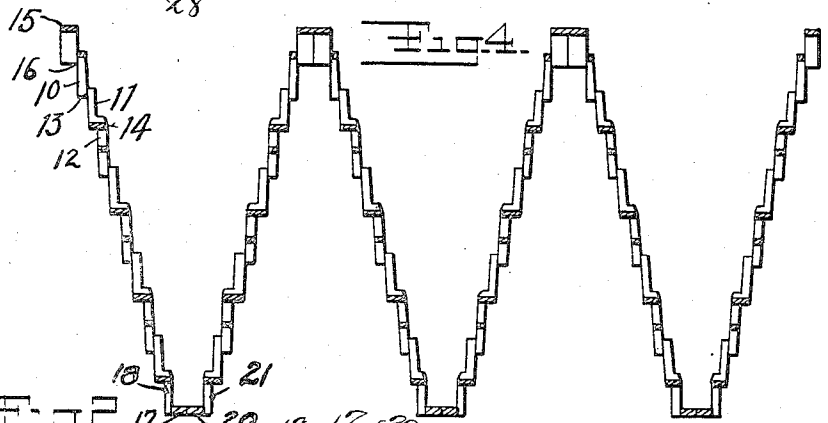


Fig. 4.



Fig. 2.

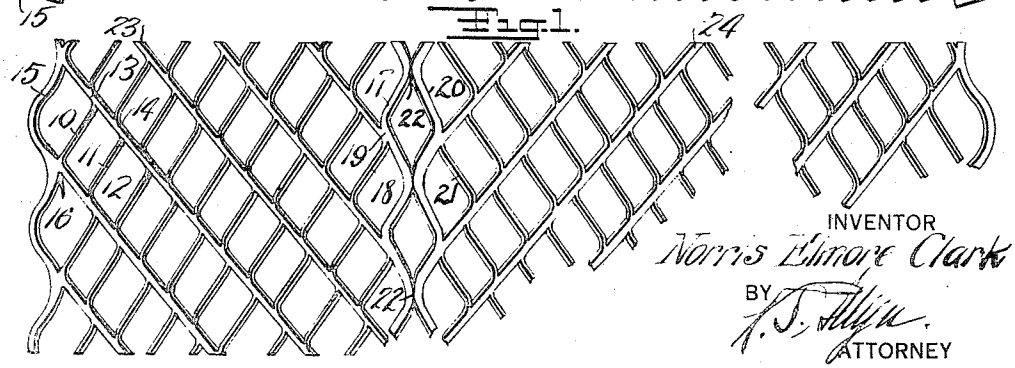


Fig. 1.

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EXPANDED-METAL FABRIC.

Original application filed December 7, 1916, Serial No. 135,518. Divided and this application filed April 14, 1919. Serial No. 290,040.

To all whom it may concern:

Be it known that I, NORRIS ELMORE CLARK, a citizen of the United States of America, residing at Plainville, Connecticut, have invented a new and useful Expanded-Metal Fabric, of which the following is a specification.

This application is a division from #135,518, filed December 7th, 1916.

The main object is to provide a rigid and desirable expanded fabric which can be made economically. The metal may be slitted longitudinally, for instance, by rotary cutters and expanded in the same machine by a separate step in such a way that the distinctive lines of bonds will extend diagonally of the sheet in zig-zag arrangement so that the sheet has lateral as well as longitudinal stiffness. The finished product will be found made up of sections, the strands of adjacent sections being inclined in opposite directions in what has become known as a reverse-lay, wherein the angularity of strands of one-half of each section is reversely laid with respect to the strands of the adjacent half section or the strands of adjacent sections are in reverse-lay. The lengthwise opening of the meshes of one-half section is preferably at an angle to the lengthwise opening of the meshes of the adjacent half section.

This combination of reverse-lay angularity of strands and oppositely disposed mesh openings produces greater uniform stiffness throughout the entire finished sheet and likewise renders the product more universal in its application in that it may be erected and plastered upon either side with any edge uppermost.

To manufacture a product of the qualities above described, I have found it practicable and economical to cut the metal blank into slitted sections, longitudinally corrugate the slitted blank to open the meshwork and then spread the sheet or flatten the corrugations. In general such a method produces a reverse-lay as for instance, in my Patents #930,350; #979,130; #1,052,888; #1,104,475; #1,104,476; #1,104,477; #1,128,659; #1,134,513; #1,146,552 and #1,146,553.

However, in my present invention instead of slitting the metal blank at an angle to the outer edges thereof, which is somewhat difficult with rotary mechanisms, I have devised a process in which the cuts are all made parallel to the outer edges so that it is especially suitable for rotary cutting and the slits are so arranged with respect to each other that many of the desired qualities in the finished product as previously outlined are still retained.

The process and machine for manufacturing the product are more fully described and claimed in my former application #135,518.

Fig. 1, is a plan view of a fragment of fabric of my invention.

Fig. 2 is an end view thereof.

Fig. 3, shows the arrangement of slitting at one edge of a sheet and indicating by dotted lines the zig-zag arrangement of bonds.

Fig. 4, is a sectional view of the fabric at one step of the formation.

The broad idea of the product will perhaps be more readily understood by first considering one form of product, for instance, the lath of substantially uniform thickness shown in Figs. 1 and 2. This has a plurality of strands such as 10, 11 and 12 connected together at intervals by bonds such as 13 and 14. The marginal strip or strand 15 is preferably wider than the strands which form the main part of the fabric. The marginal strand 15 is connected with the adjacent strand 10 by bonds such as 16, which are preferably somewhat longer than the bonds 13—14, etc. The strand 17 is connected with the adjacent strand 18 by bonds such as 19. All of the strands at the left of Fig. 1, it will be seen, are inclined edgewise downward and toward the left, whereas the strands at the right are inclined downward and toward the right. The strand 20 is connected to the adjacent strand 21 by a plurality of bonds similar to 19, and the strands 17 and 20 are connected together along the center of the section by bonds such as 22, which are preferably longer than the bonds 19 or 13. It will be seen from an inspection of Fig. 1 that the bonds at the left are arranged along diagonal lines such as 23 extending upward and to the left, whereas the bonds at the right are arranged along diagonal lines such as 24 extending upward to the right. This arrangement of bonds and strands affords more stiffness than where the bonds are arranged longitudinally or transversely of the fabric.

Fig. 3, illustrates the arrangement of slit-

ting to produce the strands just mentioned. It will be noted here that the slits or cuts 26 and 27 are so arranged that each bond such as 13 comes opposite a point near the end of one adjacent slit 26 and near the opposite end of the other adjacent slit 27. It will be seen that the slitting is such that the bonds in the left hand part of the left hand section are arranged along diagonal lines such as 23′ inclined upward and to the left at acute angles to the length of the sheet, and that the slits in the right hand part of the left section are arranged so that the bonds are inclined diagonally along lines such as 24′ inclined upward and to the right. 28 indicates one of the slits along the center of the section just described. 29 indicates the strand at the right of the slitted section just described. These slitted sections are repeated across the sheet and I have illustrated by dotted lines 30, 31, 32 and 33 the direction of the rows of bonds in successive sections. In the form shown in Fig. 3, a row of slits such as 34 extends between the left hand slitted section and the next adjacent section.

After the stock is slitted as suggested in Fig. 3, it is preferably expanded by bending the strands in the different sections into the form shown in Fig. 4, each slitted section forming a V-shaped or trough-like meshwork section of the same width but of somewhat less length. It should be understood however that the strands may be stretched or elongated and still produce a product having many of the desired characteristics herein set forth.

After expanding the stock it is preferably spread out with all the meshwork sections in a common plane, the strands of each section being inclined at an angle opposite to the angle of inclination of the strands in the adjoining section or sections. Each mesh will be seen to be bounded by two long and two short strands connected by bonds and that the bonds and short strands form practically continuous members such as 23 extending diagonally from edge to edge of each section and that these members in each section are connected by the longer strand members extending diagonally in the opposite directions. The rows of bonds and short strands form in effect diagonally disposed stiffening ribs in zig-zag rows throughout the sheet.

The wide edgewise strands 17 and 20 between the sections form sinuous ribs with openings therein and are connected by the diagonal lines of bonds and short strands.

I claim:—

1. An expanded metal sheet comprising, a plurality of connected sections, each section consisting of sinuous strands extending continuously from end to end of the sheet and arranged inclined to the plane of the sheet, adjacent strands being connected at intervals to form meshwork, the strands in adjacent sections being inclined in opposite directions and connected at intervals with a row of meshes between the sections.

2. An expanded metal fabric consisting of a plurality of meshwork sections each comprising two parts made up of narrow longitudinally extending strands connected together by rows of edgewise bonds extending diagonally, the rows of bonds in the two parts of each section converging toward the center of each section, those parts of the strands between adjacent rows of bonds joining such rows between the points at which the parts of other strands join said rows whereby the fabric has stiffness in all directions.

3. An expanded metal sheet comprising, a plurality of connected sections, each section consisting of connected inclined sinuous strands extending longitudinally and continuously from end to end of the sheet with meshes between them, each point of connection between adjacent strands of a section being considerably nearer to one end than to the other of the adjacent mesh and the strands of adjacent sections being inclined in opposite directions, the marginal strands being also sinuous.

4. An expanded fabric comprising a plurality of series of longitudinally extending bent strands arranged inclined edgewise and forming meshwork sections and each strand of each series being connected to the adjacent strands of the series by bonds arranged on edge, the strands of each series of strands being inclined in a direction opposite to the strands of the adjacent series and each series of strands having marginal strands wider than the other strands of the series, adjacent wider strands being connected so as to form longitudinally extending sinuous ribs with openings therein and sides inclined in opposite directions.

5. An expanded fabric comprising a plurality of series of longitudinally extending bent strands arranged inclined edgewise and forming meshwork sections and each strand of each series being connected to the adjacent strands of the series by bonds arranged on edge, the bond connections being located so as to provide alternating short and long connectors in the meshwork, the strands of each series of strands being inclined in a direction opposite to the strands of the adjacent series and each series of strands having marginal strands wider than the other strands of the series, adjacent wider strands being connected so as to form longitudinally extending sinuous ribs and sides inclined in opposite directions, rows of bonds and relatively short connectors in adjacent series extending diagonally in opposite directions and connecting the sinuous ribs.

NORRIS ELMORE CLARK.