E. T. REDDING.

EXPANDED METAL FABRIC AND METHOD OF MAKING THE SAME.

APPLICATION FILED FEB. 28, 1919.

1,370,362. Patented Mar. 1, 1921.

2 SHEETS—SHEET 1.

FIG. 1.

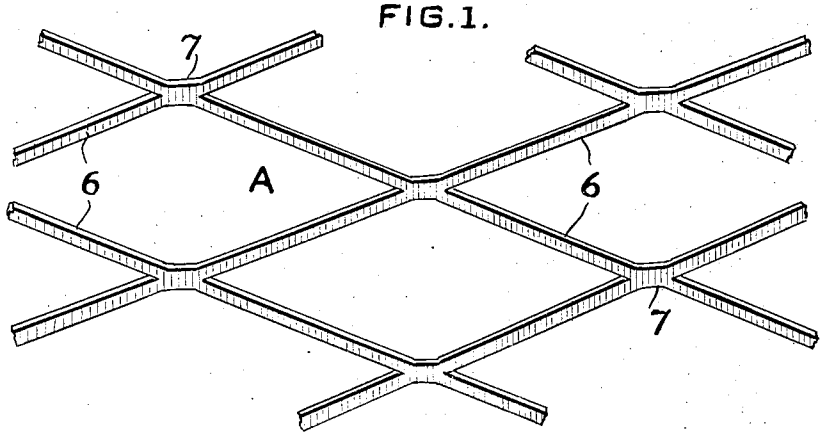


FIG. 2.

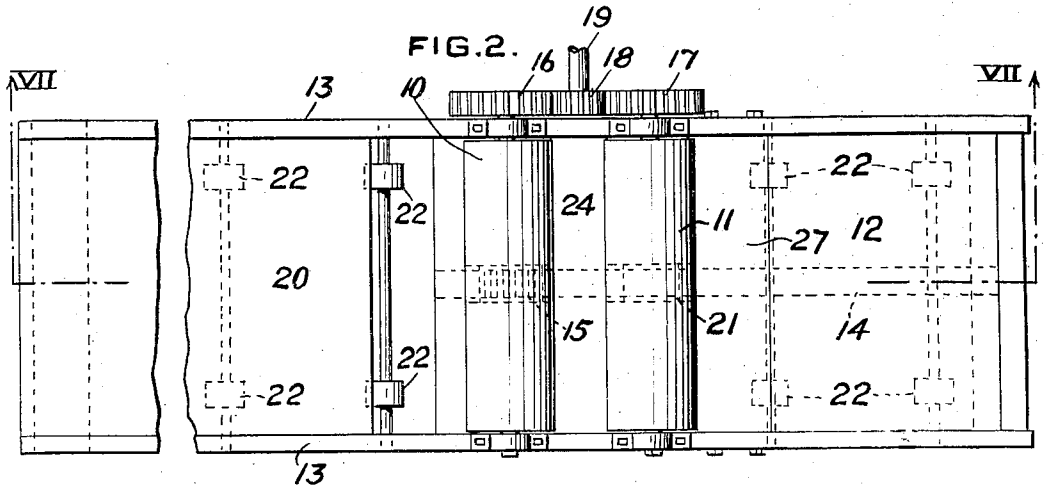
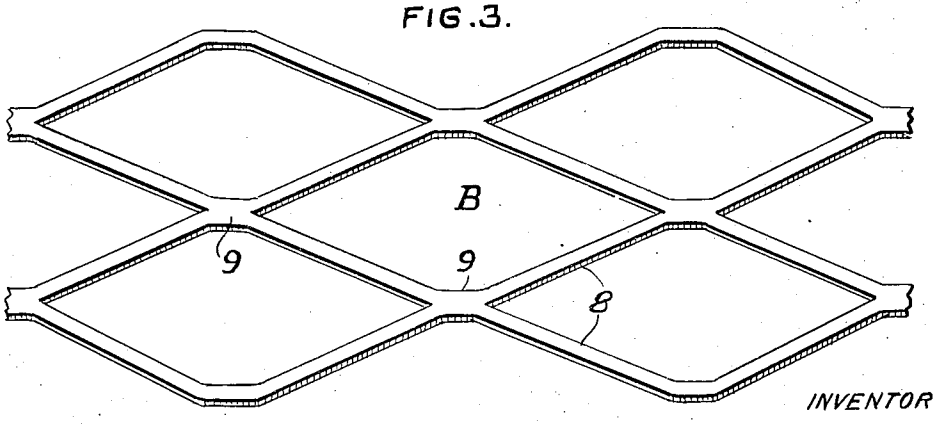


FIG. 3.



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2 SHEETS—SHEET 2.

FIG. 4.

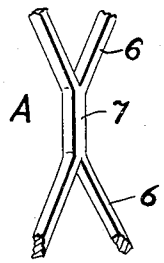


FIG. 5.

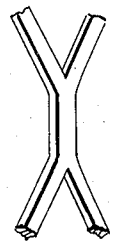


FIG. 6.

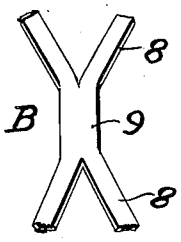


FIG. 7.

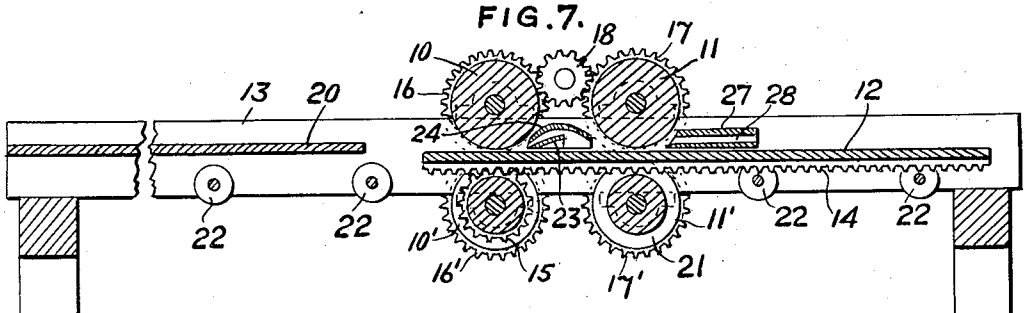


FIG. 8.

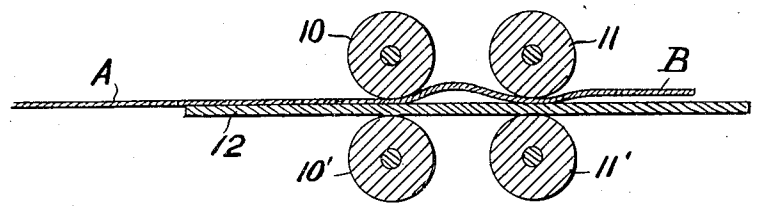


FIG. 9.

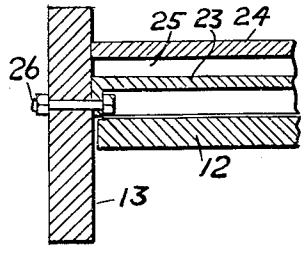


FIG. 10.

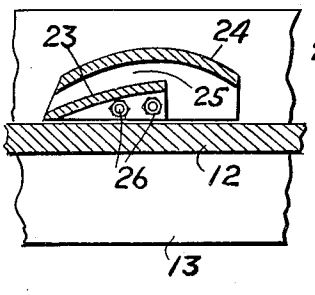
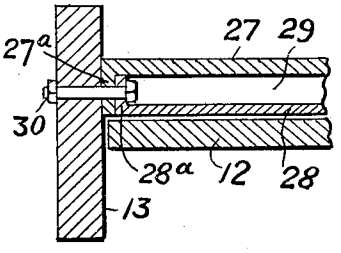


FIG. 11.



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UNITED STATES PATENT OFFICE.

EDWARD T. REDDING, OF SWISSVALE, PENNSYLVANIA, ASSIGNOR TO THE CONSOLIDATED EXPANDED METAL COMPANY, OF BRADDOCK, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

EXPANDED-METAL FABRIC AND METHOD OF MAKING THE SAME.

1,370,362. Specification of Letters Patent. Patented Mar. 1, 1921.

Original application filed September 9, 1918, Serial No. 253,149. Divided and this application filed February 28, 1919. Serial No. 279,783.

To all whom it may concern:

Be it known that I, EDWARD T. REDDING, a citizen of the United States, residing at Swissvale, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Expanded-Metal Fabrics and Methods of Making the Same, of which the following is a specification.

My invention relates to expanded metal fabric and to a method of making expanded metal fabric, as a result of which I am enabled to produce a new form of such fabric, which not only has superior physical properties but also is of such character as to render it suitable for uses for which the known types of expanded metal cannot be satisfactorily employed, as will further appear.

The primary object of my invention is to provide an improved method of treating expanded metal, such as produced by the Golding method, shown and described in the Golding Patent #527,424 of October 9, 1894, whereby I am enabled to produce my new product. Golding fabric is made of heavy stock, the strands of which are formed by a shearing operation in contradistinction to "deployed" fabric which can be formed by slitting a blank and stretching it laterally.

I accomplish the foregoing by means of a method which I have illustrated in preferred form in the accompanying drawings wherein—

Figure 1 is a perspective view of a piece of expanded metal, such as produced by the said Golding method; Fig. 2 is a plan view of an improved machine utilized in carrying out my process, and shown and described in my co-pending application, Serial No. 253,149 filed September 9, 1918, of which this application is a division; Fig. 3 is a perspective view of a piece of my new form of metal fabric; Figs. 4, 5 and 6 are enlarged perspectives of similar portions of the old product, the new product in an intermediate stage of the process of manufacture, and the new product in final form; Fig. 7 is a section taken on the line VII—VII of Fig. 2; Fig. 8 is a sectional view diagrammatically illustrating the treatment given the fabric in the machine; and Figs. 9, 10 and 11 are fragmentary sectional views of details of the machine drawn on an enlarged scale.

Referring now particularly to Fig. 1, it will be seen that the sheet A of the Golding fabric comprises the stretched metal strands 6 and the connecting bridges 7, the strands and the bridges being disposed in a substantially vertical plane with reference to the general plane of the sheet. The over-all thickness of the sheet is therefore approximately twice the width of the strands, and furthermore the stresses from bridge to bridge will be distributed in planes diagonally disposed with reference to the general plane of the sheet. In addition the sheet is very rigid. For these reasons this type of fabric although much superior to deployed metal expanded fabric, is unsuitable for certain purposes, particularly for use in concrete tiles and the like. Because of the peculiar disposition of the parts the bond between the concrete or other cementitious material, and this type of expanded metal is not very secure. In carrying out my improved method, in its preferred form, I propose to turn over the strands 6 and the connecting bridge portions 7 into the original plane of the sheet stock from which the fabric is produced. The resultant product, as shown in Fig. 3, has its strands 8 and the bridge portions 9 extending in the same horizontal plane so that the new fabric is in the form of a flat sheet.

In accomplishing this I take a sheet of expanded metal such as shown in Fig. 1, and flatten it between superposed rolls 10—10′ and 11—11′ as a medium of pressure application, the product being supported during its passage through the rolls upon a traveling plate 12, carried in the frame 13 for longitudinal reciprocatory movement therein. The rolls are adapted to rotate as a unit, and longitudinal movement is imparted to the plate 12 by means of a rack 14, on the bottom of the plate and the pinion 15, rotating with the shaft of the roll 10′. The rolls 10 and 10′ are geared together as are rolls 11 and 11′ by the upper gears 16 and 17 and the lower gears 16′ and 17′, the former being meshed with a driving pinion 18 having a driving shaft 19 operated from any suitable source of power, and provided with suitable reversing mechanism adapted to

intermittently reverse such rotation. This rotation is translated into a reciprocatory movement of the plate toward and from the table 20 upon which the rigid product is designed to be initially placed. Roll supports 22 are provided at spaced intervals to provide adequate terminal support for the plate 12 in its extreme positions.

The operation is as follows:

Assuming that the plate 12 is retracted to the opposite extreme position from that illustrated in Figs. 2 and 7; a section of the fabric A is placed upon the table 20 with the longer axes of the diamond openings at right angles to the pass of the rolls, *i. e.*, parallel to the longitudinal axis of the machine, the forward marginal edge portion of the section being in close proximity to the front rolls. When the rolls are rotated the plate 12 moves to the right and carries the fabric with it between the rolls and the fabric is subjected to a pressing action which serves to turn over all of the strands and the bridges in the same direction, so that the bridges will tend to straighten out without crimping or crushing or materially elongating the piece, the degree of flattening being determined by the relative roll adjustment. Some slight elongation may take place, this gain in length being due, however, not to any contraction in the width of the fabric, but to a possible elongation of the metal due to the rolling or to the cumulative result of a fractional gain at each bridge obtained in the process of flattening. I prefer to provide the pass with a vertical dimension which substantially equals the sum of the thickness of the plate member 12 and half the overall height of the piece being treated less a fractional part of the same.

The piece after passing through the front rolls has a tendency to spiral, *i. e.*, it begins to roll up starting at one corner and in order to break this up I provide suitable means rearwardly of said rolls, such as members 23 and 24, the former being inclined with reference to the pass of the rolls and the latter being arcuate in cross-section and placed just above the member 23 whereby to provide a curved or offset passage 25 through which the piece of material being treated passes before it reaches the second or rear pair of rolls. The members 23 and 24 are preferably secured to the sides of the frame 13 by means of bolts 26. The members 23 and 24 give a reverse bending movement to the sheet traveling therethrough and thus remove the effects of the bending action produced by the rolls 10 and 10′.

The distortion given the piece by the members 23 and 24 is of such character that the sheet after passing through the second pair of rolls 11 and 11′ is practically straight, and in order to prevent crumbling up or rolling upon itself, I provide additional means such as the two plates 27 and 28 set apart to form a straight horizontal passage 29 through which the product passes as it leaves rolls 11 and 11′. The lower plate 28 is located so as to just clear the upper face of the plate 12 and has its end 28^a secured together with the ends 27^a of the upper plate by means of the bolts 30 passing through the sides of the arm 13, as indicated in Fig. 11 of the drawings. After passing through the passage 29 the product is straightened and in its final form and is in readiness for cutting to suitable lengths such as the section of tile reinforcement illustrated in Fig. 3.

As before indicated, I prefer to provide a pressure of such character as will turn over or flatten the strands 6 to the bridges 7 so that the final product will be of substantially the same size as the original section 7, that is to say the dimensions of the strands and the connecting bridges remain the same after treatment as before.

The new fabric produced by this method takes on new qualities and lends itself very effectively to employment in concrete roof tiles and similar building slabs, and I have found by actual test that a tile so provided will stand greater tension stress than a similar tile provided with the old expanded metal product, such as the Golding expanded metal. In contra-distinction to the old product the new product is much thinner and the strains are distributed in the same horizontal plane. Inasmuch as it has been found that the reinforcement for tiling of the character described should be embedded therein on one side of the neutral axis thereof, in order to secure the most effective results, it will be seen that by the use of my improved product I am enabled to produce a relatively much thinner but equally strong tile, which will require a much less time for seasoning. Furthermore the bond between the material and the concrete fabric is much more close.

It will be seen that I provide a substantially uniform pressure throughout the area of the sheet in contact with the rolling means.

I claim:

1. The herein described process of treating a sheet of previously formed metallic stretched strand Golding fabric having strands and bridges inclined toward the vertical to produce therefrom a flat fabric which consists in turning over the strands and connecting bridges of the fabric substantially into a single horizontal plane by passing the sheet through compression means and then in leveling the sheet after it leaves the compression means.

2. The herein described process of treating a sheet of previously formed metallic stretched strand Golding fabric having

strands and bridges inclined toward the vertical to produce therefrom a flat fabric which consists in subjecting the sheet to a flattening pressure by rolling means to turn over the strands and connecting bridges into a substantially single horizontal plane and then in removing the curling or bending of the sheet imparted by the rolling means during the flattening to substantially level the sheet.

3. The herein described process of treating a sheet of previously formed metallic stretched strand Golding fabric having strands and bridges inclined toward the vertical to produce therefrom a flat fabric which consists in subjecting the sheet to a flattening pressure by rolling means to turn over the strands and connecting bridges into substantially the same single, horizontal plane, in reversely bending the sheet from its bent condition resulting from the flattening thereof in the rolls, and then in substantially leveling the sheet.

4. The herein described process of treating a sheet of previously formed metallic stretched strand Golding fabric having strands and bridges inclined toward the vertical to produce therefrom a flat fabric which consists in subjecting the sheet to a flattening pressure to turn over the strands and connecting bridges of the fabric substantially into a single, horizontal plane, without material widening or elongation of the sheet.

5. The herein described process of treating a sheet of previously formed metallic stretched strand Golding fabric having strands and bridges inclined toward the vertical to produce therefrom a flat fabric which consists in turning over the strands and connecting bridges of the fabric substantially into a single, horizontal plane by passing the sheet through a revolving compression member and a lineally traveling compression member.

6. As a new article of manufacture, a sheet of metallic fabric consisting of a previously formed sheet of Golding fabric pressed to turn over the strands and bridges into a single plane producing a flat sheet, which as compared with the previously formed sheet of Golding fabric, is not materially widened or elongated.

In testimony whereof, I have hereunto signed my name.

EDWARD T. REDDING.