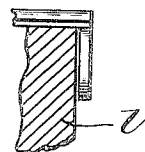
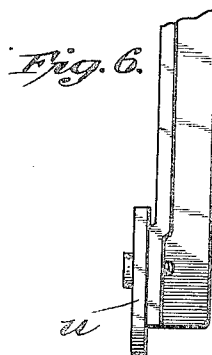
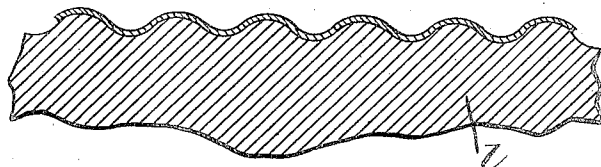
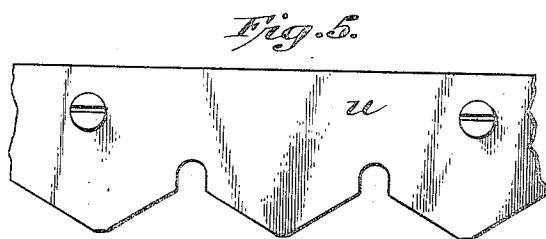
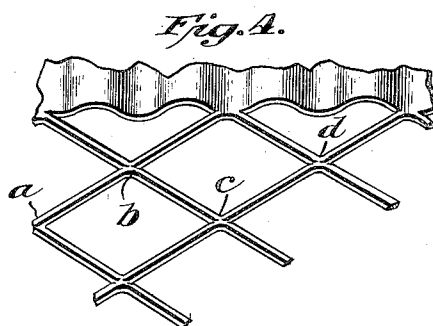
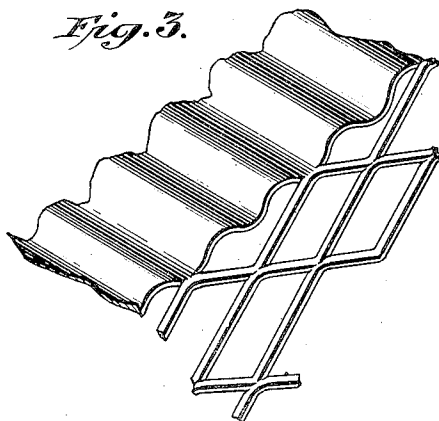
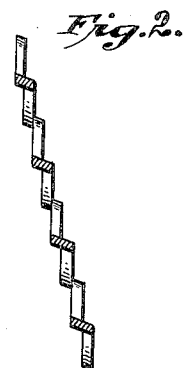
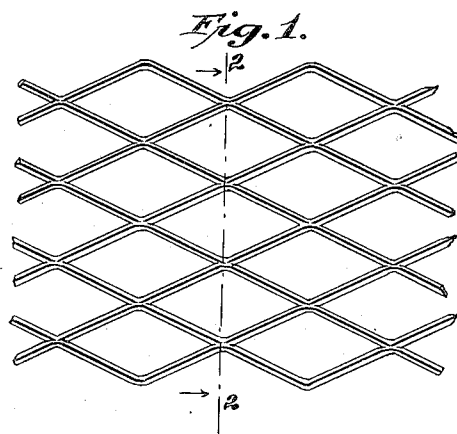


No. 821,843.

PATENTED MAY 29, 1906.

H. E. WHITE.
ART OF EXPANDING SHEET METAL.
APPLICATION FILED JUNE 10, 1905.



Attest:
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A. L. O'Brien

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by *Dickerson, Brown, Raegen & Binney*
Attys

UNITED STATES PATENT OFFICE.

HERBERT EUGENE WHITE, OF YOUNGSTOWN, OHIO, ASSIGNOR TO THE
GENERAL FIREPROOFING COMPANY, OF YOUNGSTOWN, OHIO, A
CORPORATION OF OHIO.

ART OF EXPANDING SHEET METAL.

No. 821,843.

Specification of Letters Patent.

Patented May 29, 1906.

Application filed June 10, 1905. Serial No. 264,595.

To all whom it may concern:

Be it known that I, HERBERT EUGENE WHITE, a citizen of the United States, whose residence and post-office address is Youngstown, Ohio, have invented certain new and useful Improvements in the Art of Expanding Sheet Metal, of which the following is a specification accompanied by drawings.

The invention relates particularly to so-called "expanded" metal for laths and other uses of the well-known type as exemplified in Figure 1 of the accompanying drawings, wherein a reticulated or mesh-like structure is formed from a plate of sheet metal.

Briefly stated, my present way of treating the metal consists in first crimping, corrugating, or otherwise shortening the sheet so as to provide substantially for the formation of the meshes, as hereinafter explained, and then after such preliminary step to simultaneously cut and expand or open one row of half-meshes or part meshes after another in a single straight line along the sheet.

In the accompanying drawings, Fig. 1 illustrates one form of the finished sheet. Fig. 2 is a section on line 2 2 of Fig. 1. Fig. 3 illustrates a sheet after the preliminary crimping, corrugating, or shortening and just after the first row of strands has been cut and formed into part meshes. Fig. 4 is a view of the same after three rows of strands have been cut and formed. Figs. 5 and 6 illustrate the process as performed by particular tools, one being a view edgewise of the metal and lengthwise of its corrugations and the other a view at right angles thereto.

The best way of shortening the metal to afford the slack or margin requisite to the simultaneous cutting and expanding without material stretch is by corrugating the metal regularly in a direction at right angles to the slits that are to be formed. Preferably, also, the corrugations should be spaced to correspond one with each row of joints where the adjacent rows of strands are united. This will be clear from Fig. 4, wherein the hollows of four corrugations are shown corresponding with the four joints or points of union $a b c d$. The degree of corrugation should be calculated so that the original length of the sheet before corrugation shall correspond with the final length of one strand as measured along its curves—as, for example, from a to c in

Fig. 4. The degree of corrugation or crimping is therefore dependent on the degree which it is desired to open the slits to form the meshes. When this is done, the corrugated or shortened sheet will correspond in length as measured across the corrugations with the final length of the expanded sheet as measured in a similar direction as between a and c , Fig. 4. When such a sheet is slitted, one row after another can be opened out by hand, because there is no necessary stretching of the metal, or by the use of a chisel or other suitable hand-tool one slit after another in the same straight line may be cut and opened out, as in Fig. 3, without stretching. A tool having a row of cutters, as shown in the upper portions of Figs. 5 and 6, may be employed in connection with a lower cutter which has a corrugated or crimped surface to adequately support the sheet of metal and to cooperate with the row of cutters, as plainly shown in Figs. 5 and 6. Such a row of cutters u after making the first row of cuts, as seen in Fig. 6, and of any desired width determined by the position of the metal on the lower cutter l may then be employed in a precisely similar way in making a second row of cuts and meshes alternate with the first row, the intervals between the cuts in each row determining the uncut point of union or joints, as at $b c d$ in Fig. 4, between adjacent strands. The advancing of the metal to the right in Fig. 6 after each cut will of course determine the width of the strand that is to be cut and formed. In this way I have found it is possible to make expanded metal with a width of strand that is even less than the thickness of the metal, and I have applied the process successfully to other materials than metal for the purpose of demonstrating whether the metal was subjected to any severe stretching or injurious strains. Thus I have been able to use my method on blotting-paper and other materials of exceedingly-weak tensile strength and substantially no ductility. The process is not, therefore, limited in use with metal and other materials, such as sheet-celluloid and the like, may be treated in the same way as the full equivalents of metal in this process.

The process is entirely capable of being carried out by machinery, and machines such as set forth in my copending application,

Serial No. 266,754, may be used to carry out the process.

What I claim, and desire to secure by Letters Patent, is the following:

- 5 1. In the art of making expanded metal and the like, the improvement that consists in first corrugating a sheet to correspond with the opening or expansion and subsequently slitting and expanding or opening the metal,
10 one line of slits after another thereby straightening out the corrugations, leaving unsevered joints or connections between the rows of strands so formed, for substantially the purposes set forth.
- 15 2. In the art of making expanded metal and the like, the improvement that consists in first corrugating the sheet to shorten it and afford provision for the expansion or opening without substantial stretching, and then slit-
20 ting transversely to the said corrugations and pressing and forming the strands away from the general plane of the corrugated sheet, thereby straightening out the corrugations to form a row of meshes or part meshes and
25 then successively slitting and forming other rows in like manner leaving uncut connections between the strands of adjacent rows, substantially as described.
- 30 3. In the art of making expanded metal and the like, the improvement that consists in first crimping or corrugating the sheet in a manner to shorten it in the direction of the slits to be formed and then simultaneously
35 slitting and bending portions of the sheet in such manner as to substantially straighten out the corrugations in the strands so formed while leaving such strands connected to the body of the sheet between such slits, and then simultaneously slitting and bending in
40 like manner in places alternate to the first-mentioned portions, thus producing the finished expanded sheet metal of substantially the same length as the corrugated or shortened sheet, substantially as described.
- 45 4. The improvement in the art of making

expanded metal and the like, that consists in first corrugating, crimping, or shortening the sheet in the direction of the slits to be formed, and then simultaneously slitting and opening portions of the sheet thereby straightening
50 out the corrugations to form meshes or part meshes.

5. The improvement in the art of making expanded metal and the like, that consists in first corrugating, crimping, or shortening the
55 sheet in the direction of the slits to be formed, and then slitting and expanding portions of the metal thereby straightening out the corrugations to form an open or reticulated expanded structure without substantial stretch-
60 ing of the metal itself.

6. The method substantially as herein described of making expanded or reticulated metal-work, which consists in simultaneously
65 slitting and bending portions of a sheet of metal without stretching or elongating the strands connecting the slit portions and body of the sheet, and then similarly slitting and bending in places alternate to the first-
70 mentioned portions, thus producing the finished expanded sheet metal of the same length as the original sheet.

7. The method substantially as herein described of making expanded or reticulated
75 metal-work, which consists in simultaneously slitting and bending portions of a corrugated sheet of metal without stretching or elongating the strands connecting the slit portions and body of the sheet, and then similarly
80 slitting and bending in places alternate to the first-mentioned portions, thus producing the finished expanded sheet metal of the same length as the original sheet.

In testimony whereof I have signed this specification in the presence of two subscrib-
85 ing witnesses.

HERBERT EUGENE WHITE.

Witnesses:

WILLIAM A. KINGSLEY,
ORSON D. KAISER.