(No Model.)

B. W. PETERSON.

METHOD OF ORNAMENTING SHEET METAL PANELS.

No. 453,564. Patented June 2, 1891.

Fig. 1.

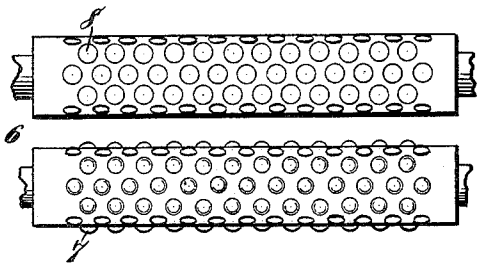


Fig. 2.

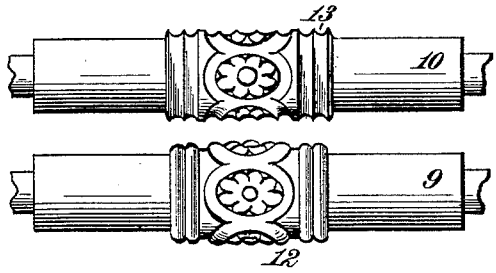


Fig. 3.

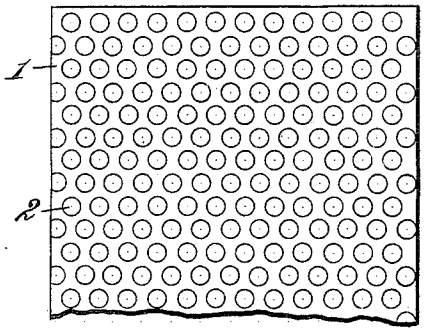


Fig. 4.

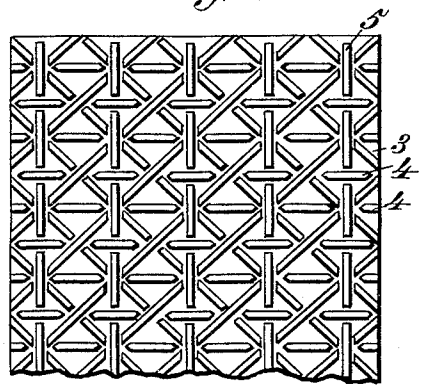
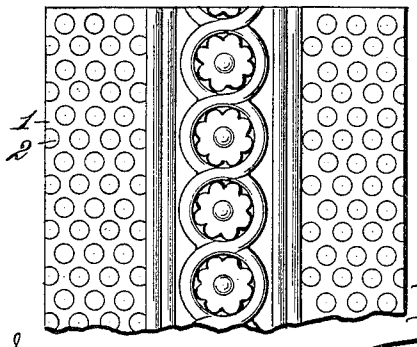


Fig. 5.



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UNITED STATES PATENT OFFICE.

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METHOD OF ORNAMENTING SHEET-METAL PANELS.

SPECIFICATION forming part of Letters Patent No. 453,564, dated June 2, 1891.

Application filed February 18, 1891. Serial No. 381,848. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN WALKER PETERSON, a citizen of the United States, residing at Wheeling, in the county of Ohio and State of West Virginia, have invented new and useful Improvements in Methods of Manufacturing Sheet-Metal Panels, of which the following is a specification.

My invention relates to the manufacture of embossed sheet-metal panels for ceilings, side walls, and for other purposes, and my purpose is to provide a novel method of forming or embossing ornamental patterns or designs upon sheet metal, by which the warping, twisting, or drawing of the sheet shall be avoided.

In embossing sheet metal with ornamental designs of various forms it has been found practically impossible heretofore to prevent the sheet from warping or drawing in such manner that after coming from the embossing rolls or press it is permanently twisted out of shape and rendered unfit for the use for which it was intended, as the embossed sheet will not lie flat nor form a perfectly-level uniform surface. This deformity in the sheet varies in degree with the form of the design and the height of the relief, being produced by the unequal strain imposed upon the body of the metal sheet by drawing part of the metal therefrom at and near the margins of the relief and the exertion of this violent and unequal strain in different directions upon the contiguous portions of the sheet. To the end that I may remove this objection my invention consists in the novel method hereinafter described, and then more particularly defined in the claims.

To enable others skilled in the art to practice my said invention, I will now proceed to describe the same in detail, reference being had to the accompanying drawings, showing one form of apparatus for the practice thereof, and in which—

Figure 1 is an elevation of an embossing mechanism constituting the first set of devices for forming the preliminary relief in the sheet metal. Fig. 2 is a similar view showing a second set of embossing devices for forming the ornamental design or pattern. Fig. 3 is a plan view of a sheet of metal, showing the application thereto of one form of preliminary pattern or relief. Fig. 4 is a similar view of a metal sheet having a preliminary pattern or relief of a different form. Fig. 5 is a view of a metal sheet, showing the application of the ornamental design and the substantial absorption of the preliminary relief.

In the said drawings, the reference-numeral 1 indicates a sheet of metal of any suitable size, form, and thickness to adapt it to form a panel for ceiling and other analogous uses. In this sheet and extending over its entire surface I emboss a preliminary relief consisting of a series of similar figures or combinations of figures, this pattern being formed, ordinarily, in comparatively low relief, though the height may be varied according to the requirements of the ornamental design which is to be applied to or formed in said sheet afterward. It will be seen, also, that the character of the similar figures forming this preliminary relief may, if desired, be varied according to the taste or preference of the manufacturer or designer or according to the height of the relief and the nature of the design constituting the ornamental pattern. This preliminary or preparatory relief has no tendency to warp, twist, or draw the sheet, since the figures or combinations of figures are all similar, equidistant throughout, and coextensive with the entire surface of the sheet. They form, however, a reserve of metal which may be drawn upon in the formation of the final or ornamental relief and whereby sufficient bodies of metal are provided at a series of different points to supply metal for the ornamental relief, and thereby avoid the violent and unequal strain upon the plain sheet which is produced at all points contiguous to the ornamental relief by striking up said pattern therefrom.

The preliminary or preparatory relief may consist of a series of equidistant nipples or conoidal figures 2, or it may be formed in the shape of a low pyramidal figure. Again, it may consist of the design 3, which is substantially a repetition of the letter X, with two transverse pointed lines 4, their points touching the intersection of the limbs of the letter, and a longitudinal line 5, crossing the intersection. It may also be formed by a double or cross corrugation of the sheet or by any one of a great variety of forms too numerous to mention.

The relief, whether it be what I have termed the "preliminary" or "preparatory" relief or the ornamental design, may be formed by any suitable mechanism, such as embossing-rolls, an embossing-press, or other means. I have shown rolls in the drawings, as I consider them preferable in many respects; but I do not confine my invention to the use of any specified form of such mechanism. The rolls, when these are used, consist of two separate sets journaled in suitable supports and driven by power from any source. The rolls 6 in the drawings constitute the first set, which are provided, respectively, with similar male and female dies 7 and adapted to form the preliminary relief, the dies being of any pattern, or, in other words, being formed to emboss figures in relief of any suitable shape arranged at equal intervals and extending over the whole surface of the sheet metal. The second set of rolls is indicated by the numerals 9 and 10, and these are provided with dies 12 and 13, which are so formed as to emboss upon the prepared sheet the ornamental design. The latter is frequently confined to a portion of the sheet only—as, for example, the central longitudinal portion; but it may be extended, if desired, over a greater or less portion or applied to two or more different portions, and variations of this character may be of almost infinite variety.

By this invention I am enabled to avoid the difficulty heretofore experienced in embossing sheet metal with ornamental designs in relief. By forming the "preliminary relief," as I have termed it, and then embossing the prepared sheet of metal to form the decoration I provide at a series of points a reserve of metal from which the final or ornamental relief may be formed without warping, drawing, or twisting the sheet. As I have already stated, the preparatory relief may be of a height different from that of the ornamental relief, and the intervals between the figures constituting the preliminary relief may be greater or less, according to the circumstances of each case and the taste of the manufacturer or designer. These figures also are preferably of some ornamental form.

What I claim is—

1. In the manufacture of sheet-metal panels for ceilings, side walls, and for other uses, the process or method set forth, consisting in applying to or forming in sheet metal a preliminary or preparatory relief consisting of a series of similar figures or a uniform repetition of the same figure or design, whereby a reserve of metal is provided, which may be drawn into or taken up by the relief of the design forming the ornamental pattern, and then embossing the latter in the prepared sheet of metal, substantially as specified.

2. In the manufacture of sheet-metal panels, the method set forth, the same consisting in first embossing in or upon a suitable sheet of metal a preparatory or preliminary relief of any suitable height, said relief consisting of a series of similar figures, or a uniform repetition of the same figure or design at uniform intervals, whereby a reserve of metal is provided, which may be drawn into or taken up by the relief of the design forming the ornamental pattern, and then embossing the latter in the sheet thus prepared, substantially as described.

3. In the manufacture of sheet-metal panels, the method of embossing ornamental designs therein, as hereinbefore set forth, the same consisting in forming in the sheet metal a series of similar figures at equal intervals in relief, said relief being coextensive with the sheet of metal, whereby a reserve of metal is provided, which may be drawn into or taken up by the relief of the ornamental design, and finally embossing said design in the prepared sheet of metal, substantially as described.

4. In the manufacture of sheet-metal panels for ceilings and for other uses, the method herein set forth for embossing ornamental designs therein, the same consisting in first forming in the sheet metal a preliminary relief consisting of a series of similar figures or combinations of figures at uniform intervals, said relief being coextensive with the said sheet, and then embossing a portion of said sheet with an ornamental pattern in relief, substantially as described.

In testimony whereof I have hereunto set my hand and affixed my seal in presence of two subscribing witnesses.

BENJAMIN WALKER PETERSON. [L. S.]

Witnesses:
I. S. GIBBS,
C. H. WATKINS.