

J. H. SHERMAN.
HOLLOW METALLIC TILE.
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1,066,229.

Patented July 1, 1913.

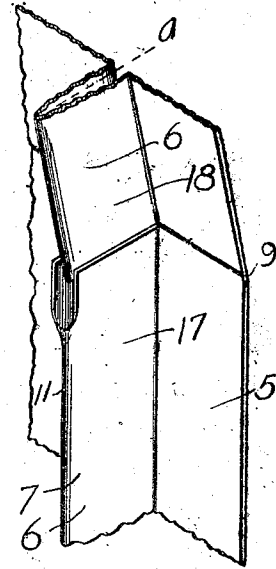
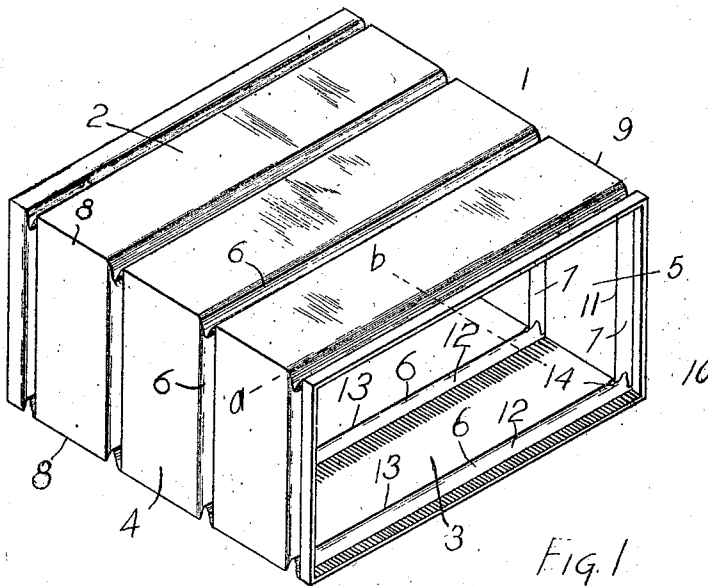


Fig. 1

Fig. 6

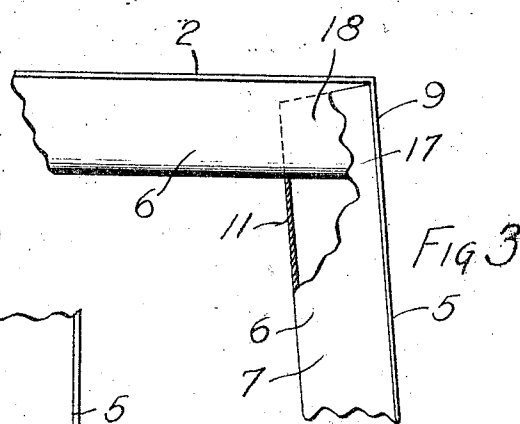
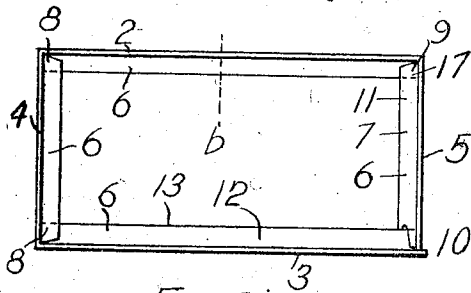


Fig. 2

Fig. 3

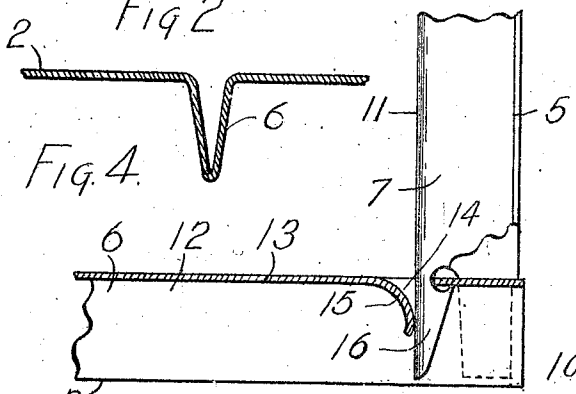


Fig. 4

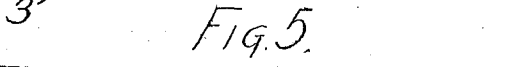


Fig. 5

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HOLLOW METALLIC TILE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JAMES H. SHERMAN, a citizen of the United States, residing at Kansas City, Jackson county, Missouri, have invented certain new and useful Improvements in Hollow Metallic Tiles, of which the following is a specification.

This invention relates to improvements in hollow metallic tiles designed as a substitute for hollow terra-cotta tiles employed in spanning between floor beams in concrete building construction.

In employing hollow terra-cotta tiles in concrete floor construction, a string of tiles, placed end to end, is supported on a scaffold which is to form the base of a mold. A second string of the tiles is then placed on the scaffold, parallel with the first string, and at such distance from the first string as to leave room for the poured concrete to form the floor-beam, and so on with other strings of tiles and beam-spaces to provide for the desired floor area. Concrete is then poured into the beam-spaces, which spaces may be provided with metallic reinforcements for the concrete, and concrete is also placed for a suitable thickness over the tiles. When this work has set and the scaffold has been removed then there is a floor structure formed of concrete beams spanned by hollow terra-cotta tiles and having an overlay of concrete to receive the flooring. The under surface of this general floor structure may be plastered. These terra-cotta tiles are rather costly, especially in shipping, owing to their bulk.

In my Patent No. 1,009,865, of November 28th, 1911, I set forth a hollow metallic tile designed as a substitute for the hollow terra-cotta tiles above referred to. In my patented construction I took a piece of sheet metal; I formed crimped parallel ribs running lengthwise of the sheet; I formed the metal foraminous between the ribs in order to furnish a superior toothing to hold concrete; the length of the sheet would be such as to form the closed top, bottom and sides of the metallic tile, which was designed to be the same size as a terra-cotta tile; the width of the sheet of metal was to correspond with the desired length of the tile; this sheet was to be bent to form a four-sided box-shaped tile; the ribs were to project inside the tile to reinforce it; the ribs were formed with cuts and slits to permit the sheet to be bent at the points where the

corners of the box-like tile were to be; at one of the corners of the tile, where the final closure of the bent-up structure was to be effected, the contiguous walls were connected, as by means of rivets or the like. These metallic tiles had strength superior to that of the terra-cotta tiles and they could be shipped before being bent-up into box form.

My present invention designs to improve upon the metallic tile of my patent above referred to, the improvements looking to a superior arrangement of the corners and to avoid the necessity for the employment of rivets or other extraneous fastenings at such corner or corners as are formed by uniting separate wall edges.

The present invention will be readily understood from the following description taken in connection with the accompanying drawing in which:—

Figure 1, is a perspective view of a hollow metallic tile exemplifying my present invention: Fig. 2 an end view of the same: Fig. 3 a view, on an enlarged scale, of the bent-up upper righthand corner of Fig. 2, a portion appearing in section in the plane of line *a* of Figs. 1 and 6: Fig. 4 a transverse section through one of the ribs of the top of the tile in the plane of line *b* of Figs. 1 and 2: Fig. 5, an elevation, on an enlarged scale, of the lower right-hand corner of Fig. 2, portions appearing in section in the plane of line *a* of Figs. 1 and 6, it being understood that this particular corner of the tile is the one where the final closure is to be effected after the metal is bent-up to box form: Fig. 6 is a perspective view of a portion of the tile showing the ends of adjacent ribs, the one rib being slotted to receive the other rib.

In the drawing:—1, indicates the exemplifying hollow metallic tile as a whole, in its completed condition: 2, the roof of the tile: 3, its floor: 4, one of its end walls, 5, its other end wall: 6, the inwardly projecting ribs extending continuously around the tile, Fig. 1 illustrating the tile as being provided with four of these ribs: 7, those portions of these ribs at that one of the side-walls of the tile which is to take part in the final seaming of the bent-up sheet: 8, the corners of the tile at the side opposite side-wall 5: 9, the corner of the tile at the top of side-wall 5: 10, the corner of the tile at the base of the side-wall 5, this cor-

ner 10 being the one where the final seaming is to take place in completing the bent-up structure: 11, the inner edges of the ribs 7 on side-wall 5: 12, those portions of the ribs 6 which are on the floor 3 of the tile: 13, the uppermost edges of these ribs 12: 14, apertures formed through the ribs 12 at the lower ends of the ribs 7, these apertures being formed by cutting loose the outer portions of the metal at the crowns of the ribs and bending downwardly the tongues thus formed: 15, the tongues thus formed in forming the apertures 14, these tongues projecting into the space below the apertures formed by bending the tongue downward: 16, outwardly and upwardly presenting hooks formed at the lower ends of ribs 7, these hooks being formed by cutting away the metal of the ribs just outwardly beyond the hooks: 17, the upper ends of the ribs 7, the inner portions thereof being slitted and separated to permit the ends of the contiguous ribs to enter between the sides of ribs 7: and 18, the end portions of the ribs which cooperate with the ends of the slitted ribs, the former entering in between the sides of the latter.

As these metallic tiles may be used either side up, and as the peculiar corner-locking now of special interest may be at any or at all the four corners, it is to be understood that such terms as top, bottom, upper, lower, etc., are employed only in the relative sense with reference to the particular manner in which the tile is illustrated in the drawing.

While the construction will naturally call for such foraminous form for the general walls of the tile as to form a proper tooth-ing for concrete, as in my earlier patent above referred to, I have thought best to illustrate the walls as being plain, for mere purpose of clear delineation. The general forming of the sheet, and the bending of it into box form, and the final utilization of it will be substantially the same as in my former patent, and therefore attention need be given mainly to the improved corner formation and to the improved system for effecting the final seaming or locking of the structure at the corner 10.

Looking at Fig. 5, assume that the structure has been bent-up to such form that the base of side-wall 5, together with its ribs 7, stands entirely above the general floor of the tile. If, now, this side-wall be forced downwardly the prongs of hooks 16 may be steered into the apertures 14 and the side-wall can be easily pushed down toward home until tongues 15 offer resistance by their contact with the faces of the ribs of side-wall 5. But these tongues are flexible, within reasonable limits, and the application of sufficient force downwardly on side-wall 5 will cause the tongues to yield inwardly and permit the points of the hooks

16 to pass downwardly so far that the hooks may be forced outwardly by the tongues and engaged under the crowns of the floor-ribs. When this is done the structure is complete and the locking or seaming at this closing corner 10 is as perfect as any necessity calls for. It is to be particularly noticed that the hooks 16 are urged to and held in proper engaging position by the springs, the springs thus far referred to being represented by the tongues 15. But, as independent of or supplemental to the springs furnished by these tongues, I provide the structure with another spring. In Fig. 3 attention is called to the inner edges 11 of the ribs 7 of side-wall 5. The inner upper ends of these ribs are slitted and cut to straddle the roof-ribs 6, thus forming male and female corner joints. If the inner edges 11 of the ribs of the side-wall were slitted so far downwardly at their tops as to clear the crowns of the roof-ribs, when the metal was bent completely to shape, then there would still be some springing effect tending to urge and hold the hooks 16 in engagement, owing to the natural resistance of the corner 9 of the tile to the bending operation. This resistance to bending holds good as regards all of the integral corners of the tile, and it is therefore seen that the tile furnishes a spring tending to urge and hold the hooks into engagement quite independent of the tongues 15. But I provide other positive springs to co-act with the hooks. Notice in Fig. 3, representing the tile corners at the top of side-wall 5, that the bending of this corner has not yet reached the ninety degree angle. But, notwithstanding this, the inner edges 11 of the vertical ribs have their tops in engagement under the crowns of the roof-ribs 6. Any further inward flexure of the vertical ribs 7 is resisted by the roof-ribs and therefore sufficient force must be applied, in flexing the side-wall inwardly, to spring the general roof somewhat upwardly. This springing of the roof of the tile tends to force the base of the side-wall outwardly and to accomplish just what is wanted at the hooks 16 in urging and holding them into engagement. Fig. 3 illustrates the incompleteness of the ninety degree bending with some exaggeration, very little being required to accomplish the desired purpose. Any trifling distortion of the general tile by reason of the springing of the roof above referred to, may be entirely ignored in structures designed for the uses of these hollow metallic tiles.

Those skilled in the art of sheet metal working will, upon analysis of the construction herein set forth, apprehend the fact that, given a flat sheet of metal of proper dimensions to form the completed structure, all necessary cutting, slitting, etc., of

the sheet may be effected before any bending or ribbing is done, and it may here be incidentally stated that all of this work, including foraminous formation, upon the flat sheet may be done by one impulse of a suitable machine which leaves the structure complete except as to the bending of the corners and the locking of the final seam.

In the illustration I have shown the tile as a complete hollow structure following, in this respect, the form of tile set forth in my earlier patent. But it should be explained that in some forms of these tiles the floor of the box-like structure may be omitted, as in cases where the tile is to form an arch instead of a lintel. In such cases the male and female corner system may be employed at the bent corners, and the hooking lock system may be employed wherever a wall of the structure is to be locked to another wall of the same or at another structure, in other words, the automatic corner locking may take the place of bent corners even in cases where the structure has less than four walls. It is to be observed, also, regarding the male and female corner-joints, that this system is employed at the locking corners 10 as well as at the bent corners.

I claim:—

1. Metallic sheet-tiling comprising a single piece multiple-wall, angular-cornered construction, said walls adjoining each other to form a corner, inwardly projecting ribs upon one of said walls and inwardly projecting ribs upon the other wall, the ends of the ribs of the second wall being slitted to straddle the contiguous ends of the ribs of the first wall, combined substantially as set forth.

2. Metallic sheet-tiling, comprising a single piece multiple-wall, angular-cornered construction, crimped ribs projecting inwardly from the walls, perforations formed in the crowns of the ribs at one edge of one of the walls, hooks formed on the ribs at the edge of the contiguous wall to engage within said perforations, and spring-mechanism to serve in urging and holding the hooks in engagement in the perforations, combined substantially as set forth.

3. Metallic sheet-tiling, comprising a single piece multiple-wall, angular-cornered construction, inwardly crimped ribs projecting inwardly from the walls, perforations formed in the crowns of the ribs at one edge of one of the walls, hooks formed on the ribs at the edge of the contiguous wall to engage within said perforations, and spring-mechanism to serve in urging and holding the hooks in engagement in the perforations, the ends of the hook-provided ribs having portions straddling the ends of the perforated ribs, combined substantially as set forth.

4. Metallic sheet-tiling, comprising a sin-

gle piece multiple-wall, angular-cornered construction, crimped ribs projecting inwardly from the walls, perforations formed in the crowns of the ribs at one edge of one of the walls, hooks formed on the ribs at the edge of the contiguous wall to engage within said perforations, and spring-mechanism integrally formed by the metal of the walls to serve in urging and holding the hooks in engagement in the perforations, combined substantially as set forth.

5. Metallic sheet-tiling, comprising a single piece multiple-wall, angular-cornered construction, crimped ribs projecting inwardly from the walls, perforations formed in the crowns of the ribs at one edge of one of the walls, hooks formed on the ribs at the edge of the contiguous wall to engage within said perforations, and lips projecting from the perforated ribs at the inner portions of said perforations to engage said hooks and hold them to active engagement in the perforations, combined substantially as set forth.

6. Metallic sheet-tiling, comprising a single piece multiple-wall, angular-cornered construction, crimped ribs projecting inwardly from the walls, rib-portions on one of the walls engaging rib-portions on the contiguous wall and serving to yieldingly resist these two walls taking position at right angles to each other, perforations formed in the crowns of the ribs at one edge of one of the walls, and hooks formed on the ribs at the edge of the contiguous wall to engage within said perforations and be held in engagement by the strain on the walls, combined substantially as set forth.

7. In metallic tile construction, two sheet metal walls adjoining each other to form a corner, each of said walls having an inwardly projecting rib, the end of the rib of one wall being slitted to straddle the contiguous end of the rib of the other wall, said walls being designed to meet at a certain angle, and said slit being of such length as to impinge against the crown of the contiguous rib so as to resist the attainment of said angle between the walls.

8. In metallic tile construction, two sheet metal walls adjoining each other to form a corner, each of said walls having an inwardly projecting rib, the end of the rib of one wall being slitted to straddle the contiguous end of the rib of the other wall, said walls being designed to meet at right-angles, and said slit being of such length as to impinge against the crown of the contiguous rib so as to resist the attainment of said angle between the walls.

9. In metallic tile construction, two sheet metal walls adjoining each other to form a corner, each of said walls having an inwardly projecting rib, the end of the rib of one wall having an aperture in its crown,

the contiguous end of the rib of the other wall having a hook to engage said aperture.

10. In metallic tile construction, two sheet metal walls adjoining each other to form a corner, each of said walls having an inwardly projecting rib, the end of the rib of one wall having an aperture in its crown, the contiguous end of the rib of the other wall having a hook to engage said aperture,

and a lip projecting from the apertured rib at the inner portion of said aperture to engage said hook to retain it in engagement with said aperture. 10

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Witnesses:

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