Nov. 1, 1949. H. L. JORGENSEN 2,486,563

CEILING PAN

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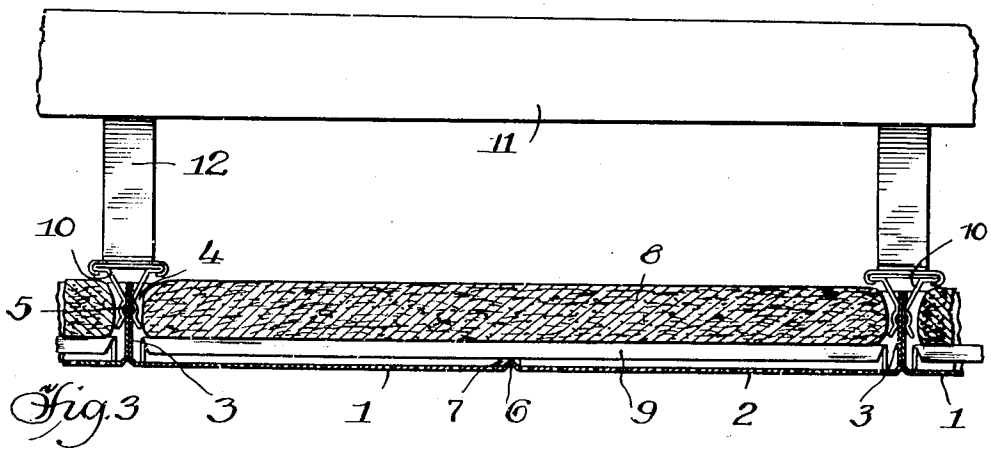


Fig. 3

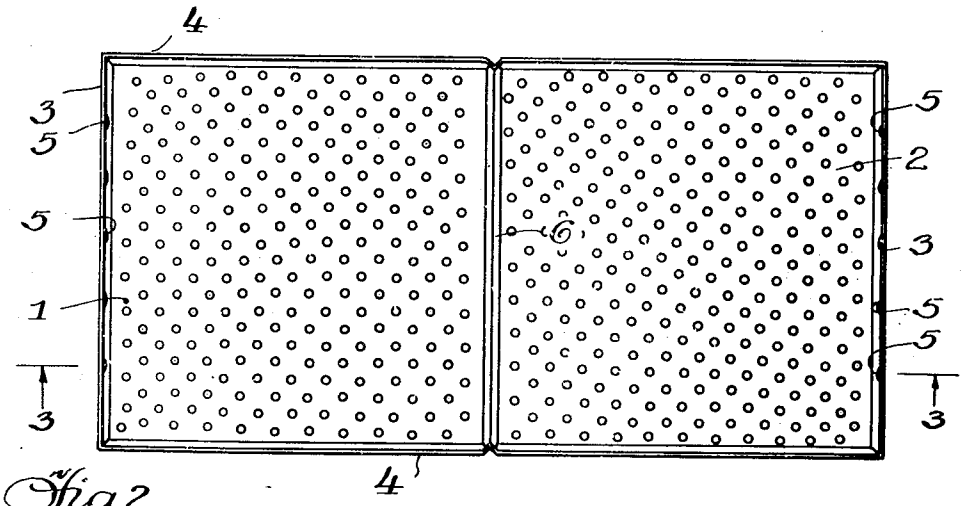


Fig. 2

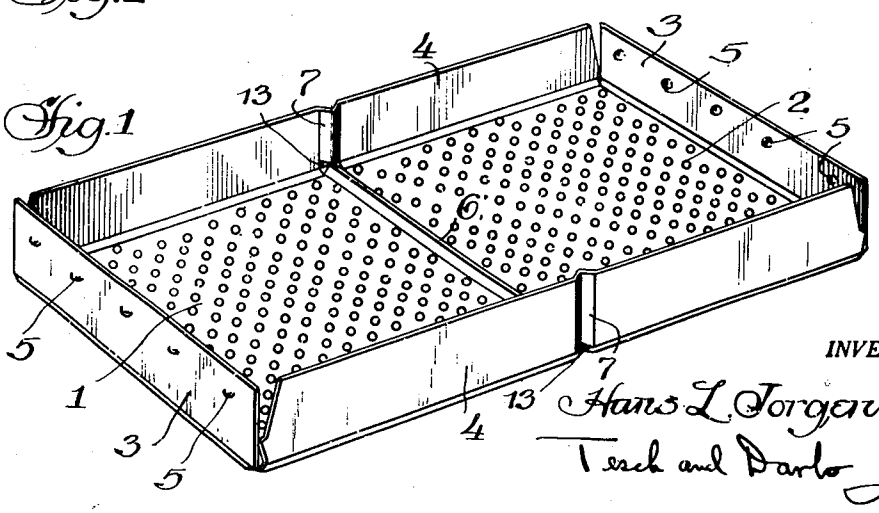


Fig. 1

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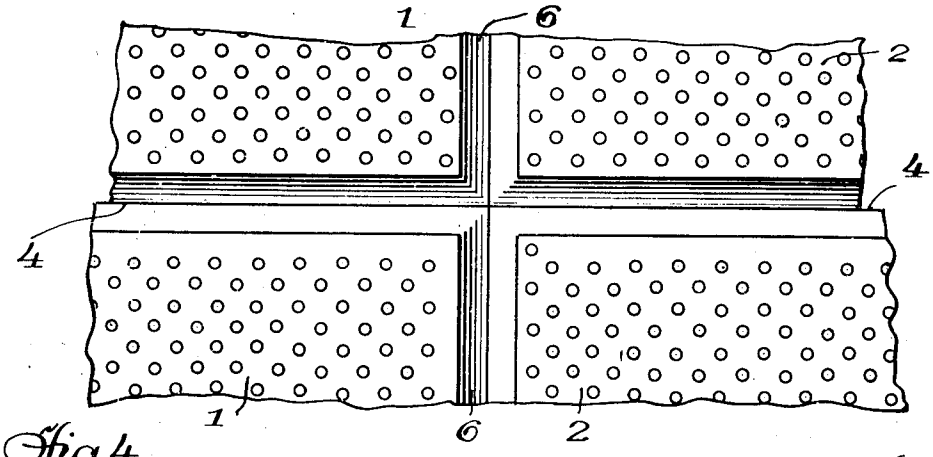


Fig. 4

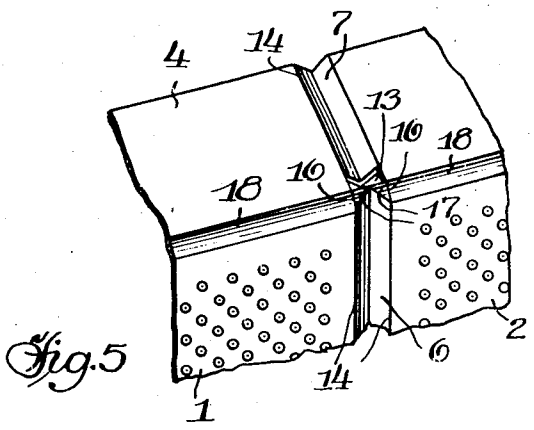
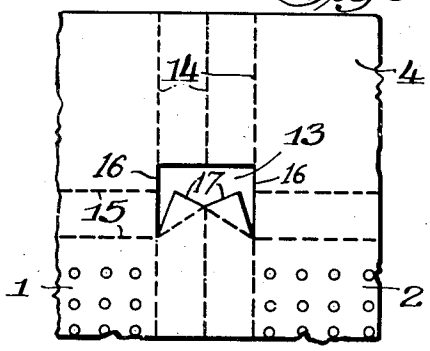


Fig. 5

Fig. 6



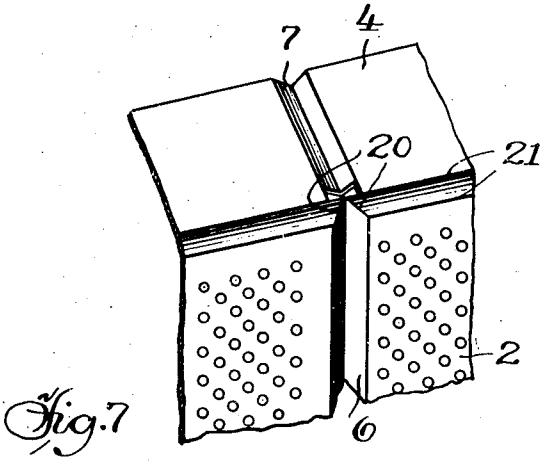
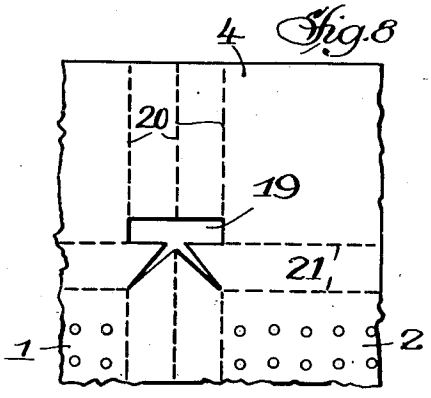


Fig. 7

Fig. 8



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UNITED STATES PATENT OFFICE

2,486,563

CEILING PAN

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6 Claims. (Cl. 189—85)

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This invention relates to sheet metal pans for suspended ceiling structures and the like. In its most important embodiment, the invention is concerned with acoustical pans for use in ceiling acoustical treatments of the type which employs a perforated metal facing and backing of a fibrous or bulky sound absorbing material.

The principal object of the invention is to provide an improved ceiling pan of economical construction which is relatively free from internal stresses that are likely to cause warpage and, consequently, an uneven ceiling of poor appearance. Another object is to provide a pan of this type which presents two tile-like surfaces to observers below wherein the multiple unit closely simulates the appearance of two separate tile-like pans and which may be fabricated on less ponderous and expensive machinery than that required for the manufacture of present pans.

A further object is to provide an acoustical pan having the characteristics hereinabove described and, in addition, having sufficient strength to carry a pad of sound absorbing material.

In the accompanying drawings,

Fig. 1 is a perspective view of an acoustical pan embodying the invention;

Fig. 2 is a top plan view of the pan of Fig. 1;

Fig. 3 is a sectional view of a portion of an acoustical ceiling treatment employing the improved pan;

Fig. 4 is a bottom plan view of a portion of the exposed surface of the acoustical ceiling of Fig. 3;

Fig. 5 is a perspective view of a portion of the improved acoustical ceiling tile;

Fig. 6 is a plan view of the portion of the improved pan illustrated in Fig. 5 before final fabrication and showing the shape of the cut-out in the blank; and

Figs. 7 and 8 are views similar to those of Figs. 5 and 6, respectively, illustrating an alternative structure.

Since this invention is likely to find its greatest utility as supporting and facing structure for acoustical ceiling treatments, it will be so described and illustrated herein. For acoustical use, the broad surfaces of the pan exposed to the room being acoustically treated are perforated to permit access of sound waves to the sound absorbing material carried and hidden by the pans. Where a simple solid suspended ceiling is to be provided, imperforate pans otherwise similar in structure to the acoustical pans may be provided. Also, while the pans may be used for vertical wall construction, the principal employment of the pans lies in suspended structures as herein described.

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Acoustical ceiling treatments of the type pertinent hereto are common and of well known construction. The structure is fully described in Norris Patent No. 1,726,500, dated August 27, 1929. It is common commercial practice in the installation of such ceilings to employ sheet metal pans having two tile-like surfaces. Such multiple units are employed for reasons of economy in manufacture and to minimize overall material and assembly costs. In order to achieve the desired uniformity of appearance of the finished ceiling, it is necessary to imitate as closely as possible a normal pan-to-pan joint at the line separating the two tile-like portions of the pan. In an attempt to simulate this joint, a groove was impressed into the exposed surface of the pan. In drawing this groove in the broad surface between the flanges of the pan, the metal of the areas of the pan adjoining the groove were severely strained and warpage often resulted. Ponderous machinery and tremendous pressures were necessary to minimize these warpage stresses and avoid distortion of the face of the pan. Such warpage and distortion were undesirable because ceilings formed from such defective units were unsightly.

The present invention provides a double-faced pan wherein the joint-simulating groove extends across the flanges as well as the face of the pan whereby distortion of the pan is entirely avoided. The additional material required for the grooving is obtained by shortening the overall length of the pan and is not drawn from a portion only of the sheet metal forming the broad surface of the pan.

As shown in Figs. 1 and 2 the acoustical pan is rectangular, being twice as long as it is wide. The broad surface of the pan, including areas 1 and 2, is beveled along all four sides. Flanges 3 and 4 are formed at the ends and sides of the pan, respectively, to provide rigidity and strength for the unit and, in the case of the end flanges 3, to provide a means for supporting the pan in the ceiling structure. For this latter purpose, a series of dimples 5 are impressed inwardly in a straight row in flanges 3. A continuous bead may be used instead of the dimples, if desired. A groove 6 extends the full width of the pan midway between the ends thereof to simulate a pan-to-pan joint. The two sides of this groove have the same appearance as the beveled edges of the pan face.

The grooves 7 in flanges 4, identical in profile to groove 6, are entirely non-functional so far as the use of the pan is concerned. They serve to take up a length of metal equal to that required in forming groove 6 and thus offer a means for

equalizing the draw across the width of the blank from which the pan is formed. In this way distortion is avoided.

In fabricating the acoustical pans in accordance with the invention, it is necessary to remove a small amount of material at the juncture of grooves 6 and 7 before bending the marginal portions of the blanks to form flanges 4. The form of this cut-out must be such that interference of the metal of the grooves is avoided and the corners of the tile-like faces 1 and 2 of the finished pan will be clean-cut and accurate. The preferred pattern for this cut-out is illustrated in Fig. 6 and the appearance of the finished pan is shown in Fig. 5. Two openings 13 of the shape illustrated in Fig. 6 are punched at the proper locations on the sheet metal blank after which the metal is bent along the fold lines 14 to form grooves 6 and 7. Flanges 4 are then formed by bending along fold lines 15. In this operation, the cut edges of opening 13 are brought together along the lines 16, the small triangular areas 17 being partially up-turned to form a continuation of the bevel areas 18. These butt joints 16 are not perceptible in the finished painted or enameled pan.

An alternative pan structure is illustrated in Figs. 7 and 8. In fabricating this device openings 19 of the form shown in Fig. 8 are punched in the sheet metal blanks, the groove formed by bending along fold lines 20, as described in connection with Figs. 5 and 6, and the flange 4 is formed by bending the material along fold lines 21. In the finished article, the cut edges of opening 19 are butted together at miter joints 20 of the tile-like faces.

In constructing the acoustical ceiling, the pans containing a suitable pad of sound absorbing material 8 spaced from faces 1 and 2 by means of narrow channel members 9 are forced upwardly between the spring legs of T-bars 10 until dimples 5 engage the beads provided on the legs of the T-bars to receive the rows of dimples. The T-bars, in turn are suspended from slab 11 by means of bands 12. This arrangement is illustrated in Fig. 3 and the appearance of the acoustical ceiling from below is indicated in Fig. 4.

It will be seen that the ceiling pan of the invention is fabricated without warpage stresses and without impairment of the tile-like faces. In place of the old practice of drawing a groove across the broad surface of the pan only, robbing the areas adjacent the groove of the necessary metal, the new ceiling pan requires only simple bending of the metal in forming the groove. The thickness of the sheet metal forming the tile-like faces of the pan is unchanged and remains uniform in the finished product.

I claim:

1. As a new article of manufacture, a fabricated sheet metal ceiling pan having upturned side and end flanges, the broad surface of said pan comprising two substantially square adjoining faces having beveled edges, the contiguous beveled edges at the juncture of said faces being formed by a groove impressed across said broad surface of said pan, the side flanges of said pan being grooved throughout the depth thereof at the ends of the groove in said broad surface, the sheet metal forming said broad surface of said pan being substantially free from warpage stresses.

2. A ceiling pan in accordance with claim 1 wherein the portions of the broad surface of said pan which form said faces are perforated.

3. The method of forming a ceiling pan having side flanges and two adjoining edge-beveled faces comprising punching small openings in a sheet metal blank at points near the sides of said blank midway between the ends thereof at the eventual location of the juncture of the side flanges at the faces of said pan, thereafter drawing an upwardly impressed groove across the entire width of the blank midway between the ends thereof, and then forming the side flanges of said pan and forming the beveled edges of the faces thereof.

4. As a new article of manufacture, a fabricated sheet metal ceiling pan having upturned side and end flanges, the broad surface of said pan consisting of two adjoining substantially square faces having beveled edges having the appearance of continuity throughout the peripheries of both said faces, the contiguous beveled edges at the juncture of said faces being formed by a groove impressed in said broad surface of said pan, the side flanges of said pan being similarly grooved throughout the depth thereof at the ends of the groove in said broad surface.

5. A new article of manufacture as defined by claim 4 wherein each beveled edge of the faces adjoining the side flanges of said pan includes a butt joint along a line extension of one side of the groove in said broad surface of said pan.

6. A new article of manufacture as defined by claim 4 wherein the junctures of the beveled edges of the faces at the ends of the groove in the broad surface of said pan are miter joints.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,655,793	McCrery	Jan. 10, 1928
1,888,096	Shaw	Nov. 15, 1932
2,112,631	MacDonald	Mar. 29, 1938