J. O. MADISON.

TRUSSED SHEET STRUCTURE.

APPLICATION FILED JULY 10, 1918.

1,300,439. Patented Apr. 15, 1919.

Fig. 1.

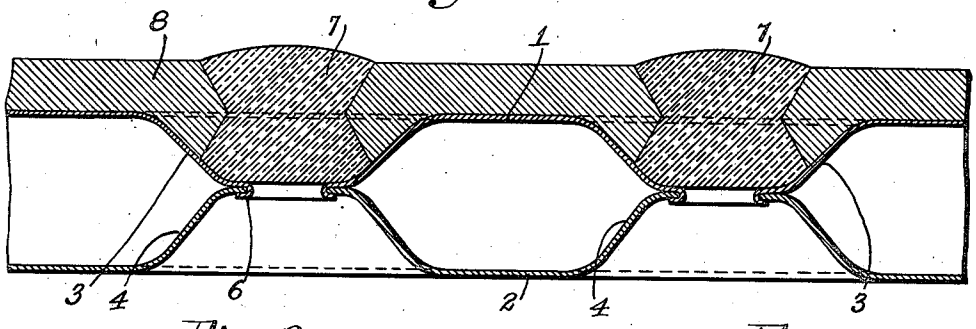


Fig. 2

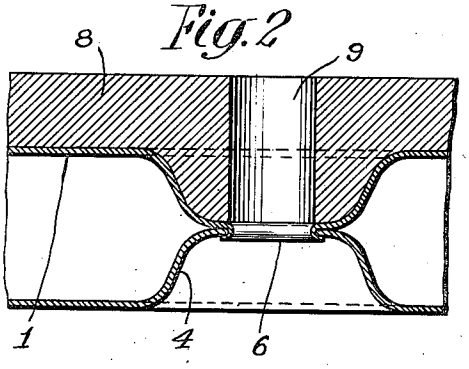


Fig. 3.

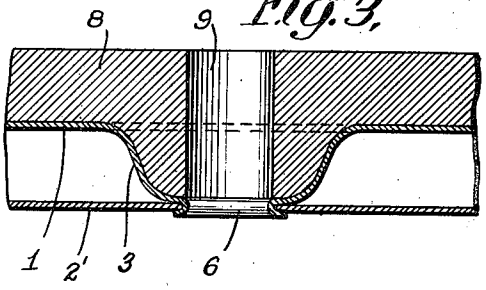


Fig. 4.

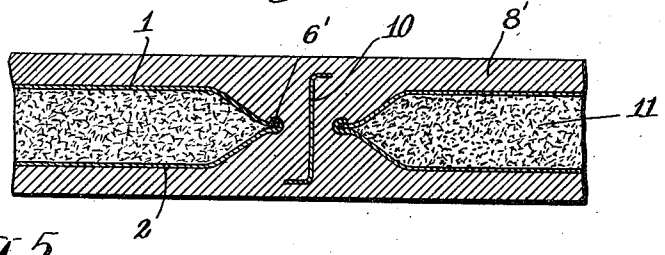
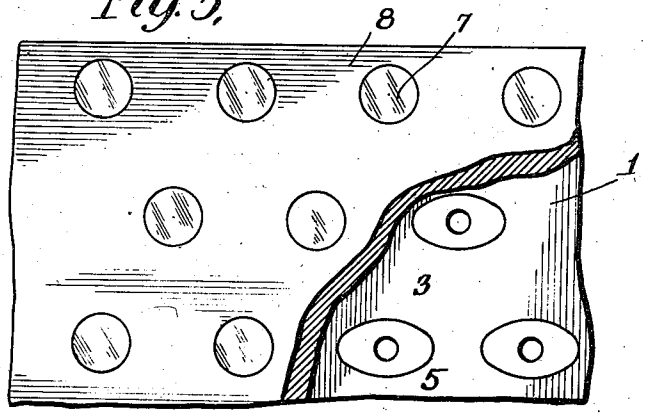


Fig. 5.



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TRUSSED SHEET STRUCTURE.

1,300,439. Specification of Letters Patent. Patented Apr. 15, 1919.

Application filed July 10, 1918. Serial No. 244,144.

To all whom it may concern:

Be it known that I, JOHN O. MADISON, a citizen of the United States, residing at Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Trussed Sheet Structures, of which the following is a specification.

My invention relates to what may be termed building material for walls, floors, ceilings and gratings for sidewalks and the like and has for its object the provision of an improved trussed sheet construction which shall be adapted to carry heavy loads and be durable and at the same time be of light weight, of economical construction and fireproof and heat and sound insulated. My present invention relates to modifications of the general invention disclosed in my application Serial Number 106,823, filed June 30, 1916, for trussed sheet building material.

The application referred to describes a construction embodying a pair of sheets, preferable of steel, which constitute the outer chord members of the trussed construction and which are rigidly connected together at certain intervals by intermediate web members composed of integral projections or depressions formed on one or both sheets and separated from each other laterally and longitudinally, these projections or depressions being of a depth many times the thickness of the sheet so as to produce a strong truss effect. My present improvement relates to a construction in which the integral depressions of each sheet have openings formed through the apex or inner portions thereof, the two sheets or chord members being positioned with the corresponding openings thereof alined and the members rigidly secured together about the edges of the openings, Thus the metal at the edge of an opening in one sheet may be pressed or spun about the metal at the edge of the opening in another sheet to form a strong and rigid connection between the sheets. The alined openings thus formed may be utilized for various purposes. In case the structure is used in the formation of a grating for a sidewalk, blocks of glass may be set over the alined openings and the space between the blocks of glass on the upper side of the trussed structure filled with concrete or other suitable plastic material so as to form a transparent grating. Or the glass blocks may be omitted and vertical openings left through the concrete in alinement with the openings in the trussed structure to form a ventilated grating. Or in the case of a monolithic wall or the like the plastic material may extend continuously over both the outer surface of the trussed structure and through the openings therein, the structure being further reinforced, if desired, by reinforcing members extending through the concrete positioned in the openings through the trussed structure, and filling material for heat or sound insulation or the like may be positioned within the trussed structure.

In order that a clearer understanding of my invention may be had, attention is hereby directed to the accompanying drawings forming part of this application and illustrating certain embodiments of my invention.

In the drawings, Figure 1 represents a partial cross-section through a transparent sidewalk grating, Fig. 2 represents a similar section through a ventilated sidewalk grating, Fig. 3 is a section similar to Fig. 2 showing a modified form of construction, Fig. 4 is a similar section through a monolithic wall construction or the like and Fig. 5 is a top plan view partially broken away, of the construction shown in Fig. 1.

Referring to the construction shown in Figs. 1 and 5, a pair of metal sheets or plates 1 and 2 constitute the outer chord members of the trussed structure and are spaced apart in a substantially parallel relation by intermediate web members which are formed integral with said sheets. The web members of the truss take the form of deep depressions which may be formed as by pressing, rolling or molding in one or both of the sheets. In the construction illustrated in Fig. 1, both sheets are provided with such depressions, shown at 3 and 4. These depressions are of a depth many times the thickness of the sheets 1 and 2 as may readily be accomplished by pressing, drawing or metal-rolling operations.

The depressions may be of desired shape but are preferably of a frusto-conical shape, as illustrated. The inner ends or the apex portions of the depressions have openings cut therethrough which may be circular, as shown at 5 in Fig. 5, or may be of other desired configuration, the sheets being alined

as in Fig. 1 in parallel relation with the openings through the corresponding depressions in axial alinement. The sheets may be rigidly secured together by pressing the metal at the edges of the openings of one sheet about the edges of the openings in the other sheet. Thus the metal at the edges of the openings in the depressions 3 may be bent and pressed about the metal at the edges of the openings in depressions 4 as is illustrated at 6, sufficient metal being left at the inner ends of depressions 3 to permit this being done. The inner end portions of depressions 3 and 4 being in proper alinement, the metal of depressions 3 may be bent about the metal at the edges of the openings in depressions 4, as shown, by suitable tools, in such a manner as to form extremely strong and rigid joints. The depressions are preferably arranged in staggered relation to each other, as is shown in Fig. 5, the distances between the same being readily calculable to produce the desired rigid effect. The depressions are also made of considerable depth, as stated, so that the material of the main bodies of the two sheets will be located at considerable distances from the middle or neutral axis of the trussed structure so as to give maximum resistance to the bending and shearing stresses and an economical distribution of the metal.

In the utilization of the construction described for a transparent sidewalk grating, or the like, suitably shaped blocks such as 7, of glass or other transparent material, may be mounted within the depressions 3 of the upper sheet and a layer 8 of concrete or other plastic material positioned upon the upper sheet 1 to cover the surface thereof between the blocks 7 and to fill in the depressions 3 about the blocks 7. The blocks 7 may be under-cut or otherwise suitably formed to anchor the same in the plastic material and the latter may be anchored in position on sheet 1 by various means, which form no part of my present invention.

A similar construction is illustrated in Fig. 2 in which, however, the transparent blocks 7 are omitted since the intention is to form a ventilated grating. In this case an opening 9 is formed through the plastic material 8 in alinement with each of the alined openings in the depressions of the two sheets. It will, of course, be understood that the openings 9 or the transparent blocks 7 need not be positioned in alinement with the alined portions of each of the depressions 3—4 but that in the case of some of the depressions no openings may be cut and the inner end portions of these depressions secured together by welding or otherwise, if desired.

It is, of course, possible in such constructions to form the deep depressions on one of the sheets only, the other sheet, constituting the opposite chord member of the truss, being plane. Such a construction is shown in Fig. 3 in which the sheet 1 is provided with depressions 3 while the other sheet 2^1, is plane, both sheets being provided with alined openings and secured together by pressing the metal of one sheet about the edges of the openings in the other sheet, as is shown at 6.

The utilization of the construction described in the formation of a monolithic wall or ceiling or the like is shown in Fig. 4. In this case the sheets 1 and 2 are provided with depressions 3 and 4 having openings therethrough, the sheets being secured together in the manner previously described, by pressing or spinning the metal at the edges of the openings in one sheet about the metal at the edges of the openings in the other sheet as is shown at 6^1. The openings in the trussed structure are in this case taken advantage of to permit the continuous joining and flowing together of the plastic material on both sides of the trussed construction to form a unitary wall. Thus, the concrete 8^1 is illustrated as being applied to the outer surfaces of both sheets 1 and 2, filling all of the depressions and extending continuously through the openings therein. If desired, metallic reinforcing members such as that illustrated at 10 may be embodied in the plastic material to extend through the openings described. Also where desired filling material 11 may be positioned within the trussed structure for the purpose of heat insulation, or deadening sound or the like, such a filler being, for example, mineral wool or other suitable material.

What I claim is:

1. In a trussed sheet structure, adapted to withstand heavy loads or stresses, the combination of two sheets constituting the opposite chord members of the truss, and each formed with permanent integral depressions of a depth many times the thickness of the sheet, said depressions forming web members spaced apart laterally and longitudinally and secured together at the inner end portions of said depressions, some of said alined inner end portions having openings therethrough with the members rigidly secured together about the edges of the openings.

2. In a trussed sheet structure, adapted to withstand heavy loads or stresses, the combination of a sheet constituting a chord member of the truss and formed with permanent integral depressions of a depth many times the thickness of the sheet, said depressions forming spaced apart web members, and having openings through their apex portions, and another sheet constituting an opposite chord member of the trussed structure, having openings therethrough corresponding to the openings through said first

sheet, said sheets being positioned with said openings alined and rigidly secured together about the edges of the openings.

3. In a trussed sheet structure, adapted to withstand heavy loads or stresses, the combination of a sheet constituting a chord member of the truss and formed with permanent integral depressions of a depth many times the thickness of the sheet, said depressions forming spaced apart web members, and having openings through their apex portions, and another sheet constituting an opposite chord member of the trussed structure, having openings therethrough corresponding to the openings through said first sheet, said sheets being positioned and secured together with said openings alined, the material at the edges of the openings in one sheet being bent and pressed about the material at the edges of the openings in the other sheet.

4. In a trussed sheet structure, adapted to withstand heavy loads or stresses, the combination of a sheet constituting a chord member of the truss and formed with permanent integral depressions of a depth many times the thickness of the sheet, said depressions forming spaced apart web members, and having openings through their apex portions, another sheet constituting an opposite chord member of the trussed structure, having openings therethrough corresponding to the openings through said first sheet, said sheets being positioned with said openings alined, and rigidly secured together about the edges of the openings, and a layer of plastic material applied to said first sheet and partly filling said depressions, said material having openings therethrough substantially alined with the openings in said sheets.

This specification signed and witnessed this 29th day of June, 1918.

JOHN O. MADISON.

Witnesses:
DYER SMITH,
M. S. GANG.