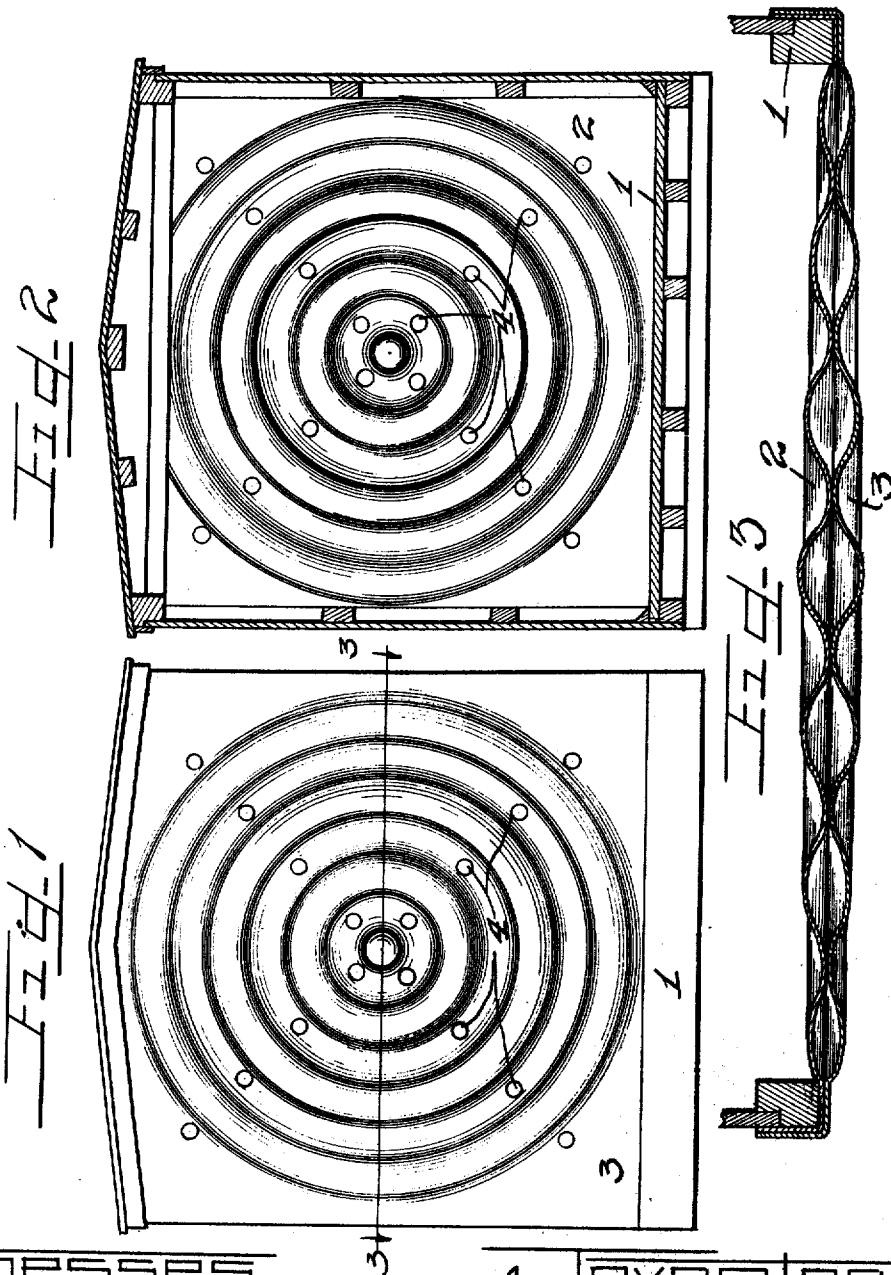


1,241,685.

Patented Oct. 2, 1917.
4 SHEETS—SHEET 1.



WITNESSES
W. Angell
Charles W. Hill

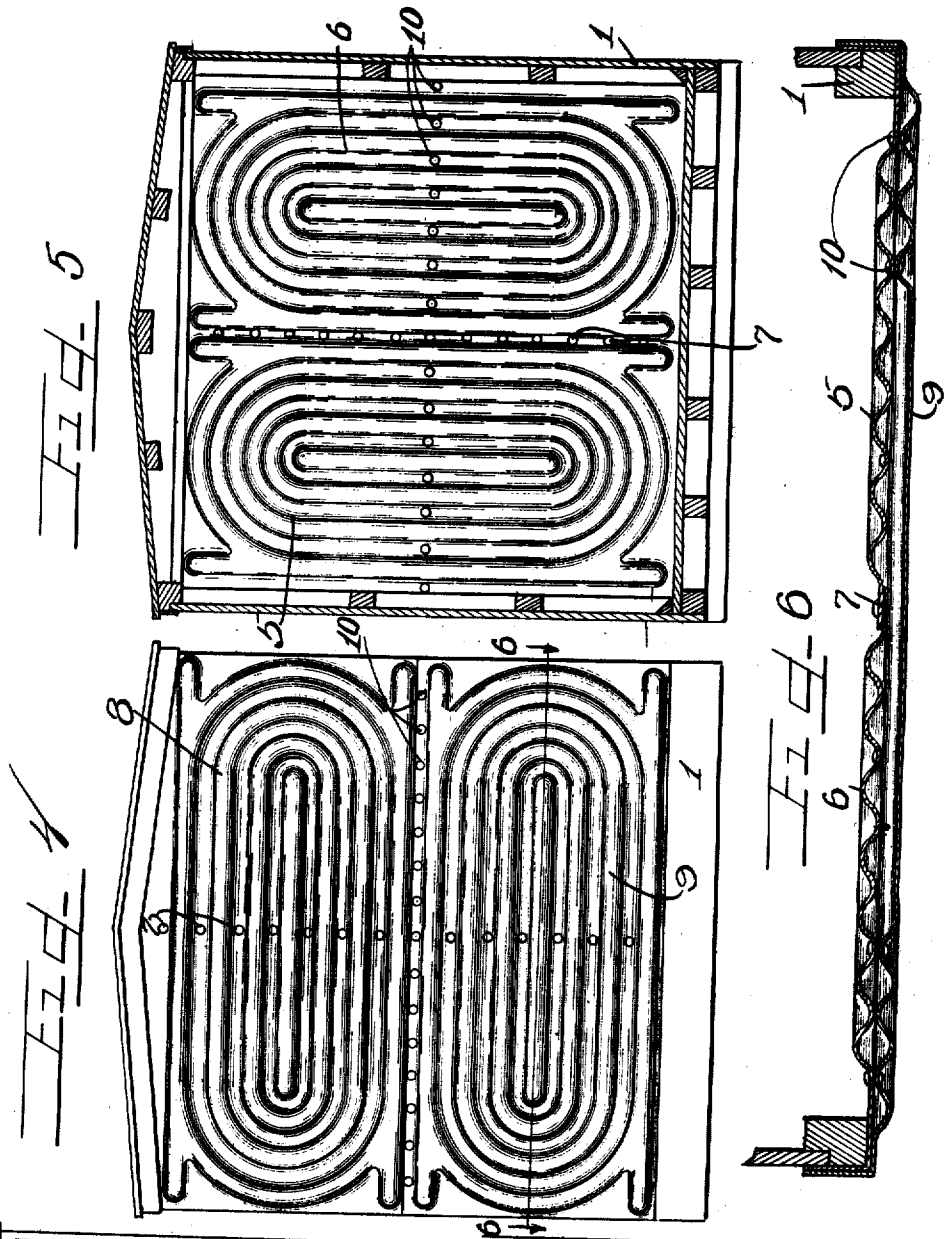
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H. E. VAN DORN.
 CAR END CONSTRUCTION.
 APPLICATION FILED NOV. 26, 1915.

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4 SHEETS—SHEET 2.



WITNESSES

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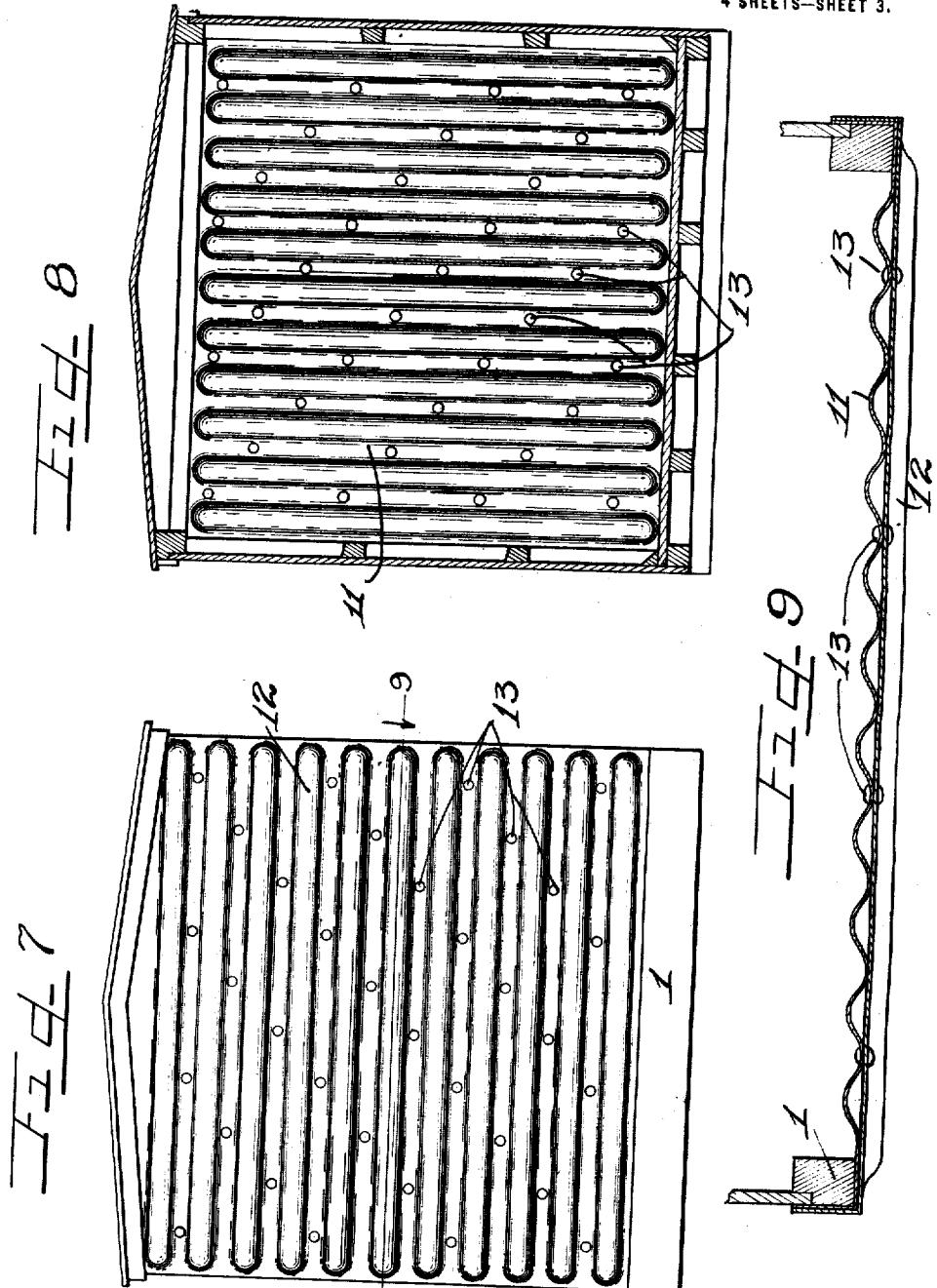
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4 SHEETS—SHEET 3.



WITNESSES

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4 SHEETS—SHEET 4.

Fig. 10

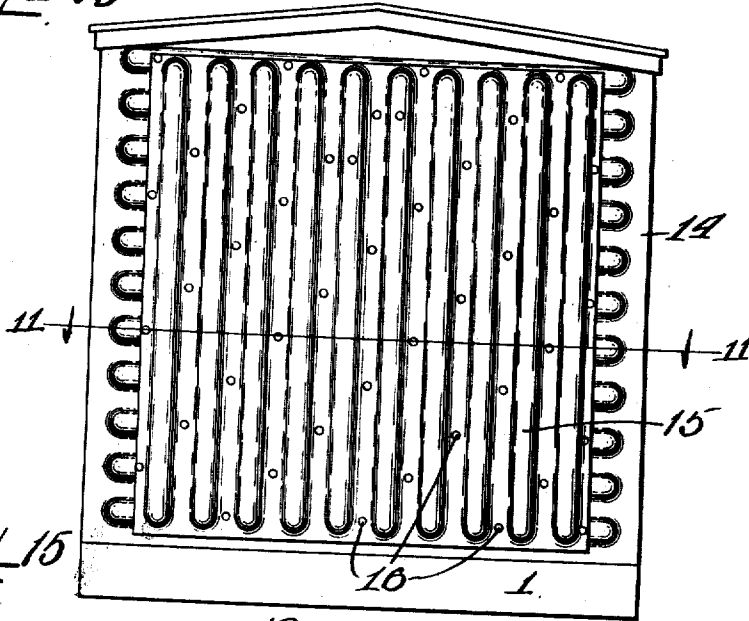


Fig. 15

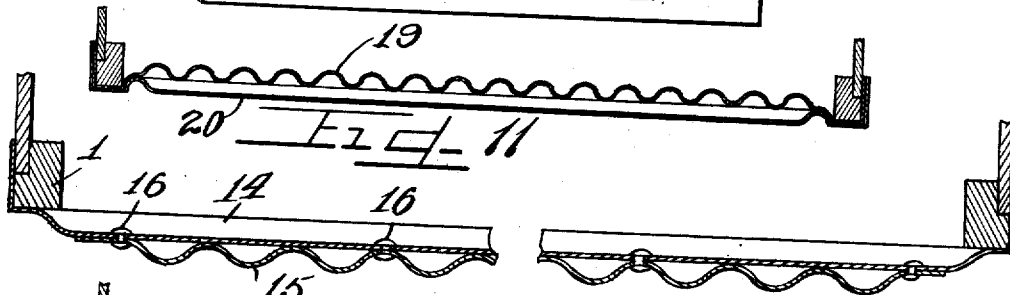


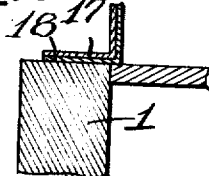
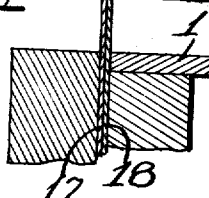
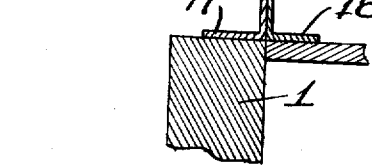
Fig. 11

Fig. 16

Fig. 12

Fig. 13

Fig. 14



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UNITED STATES PATENT OFFICE.

HERBERT E. VAN DORN, OF CHICAGO, ILLINOIS.

CAR-END CONSTRUCTION.

1,241,685.

Specification of Letters Patent.

Patented Oct. 2, 1917.

Application filed November 26, 1915. Serial No. 63,633.

To all whom it may concern:

Be it known that I, HERBERT E. VAN DORN, a citizen of the United States, and a resident of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Car-End Constructions; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the numerals of reference marked thereon, which form a part of this specification.

Certain types of steel ends have in the past few years come into wide use to meet the present severe conditions of heavily loaded cars. However, the types of cars are changing, steel construction taking the place of wood construction, and furthermore the cars are larger and, with the steel construction, very much heavier, and more is being required of the ends. All steel ends now made are formed to produce the greatest strength for the particular type and weight involved. The steel in the end can only be pressed a certain depth for its weight without being fractured, and in order to produce steel ends of sufficient strength to meet increasing conditions, the corrugations must be made deeper, which necessitates using heavier plates.

An objection heretofore existing in the use of metal ends is the heat conductivity of the metal which causes the end, for instance under intense sunlight, to absorb the light and transmit the heat to the interior of the car. By this invention a stronger end than heretofore is produced without materially increasing the total weight of the structure, and furthermore, due to the provision of a dead air space, a less co-efficient of heat conductivity is obtained.

This invention relates to what may be termed a double plate car end constructed of metal for attachment on cars, and one of inherently greater strength than types of single ends heretofore constructed. Due to the fact that the combined depth of the corrugations in the double plate end is nearly twice that of the single plate end, and since the plates are made of lighter material, the weight of the double plate end is about the same as that of the heavy single plate end of less strength.

It is an object therefore of this invention to provide a metal car end construction embracing a plurality of sheets of metal cor-

rugated and laid against each other and secured one to another for attachment to the end of a car.

It is also an object of this invention to construct a car end comprising a plurality of sheets of metal secured one to another and each corrugated and so disposed that the corrugations of one sheet extend inwardly within the car and those of the other sheet outwardly from the car with the contacting surfaces of the plates riveted one to another to afford substantially a unitary structure.

It is also an object of this invention to construct a car end comprising a plurality of corrugated sheets of metal, the corrugations of each plate extending outwardly from the surface of the plate so that the inner surfaces of the plates and corrugations lie in the same plane, and may be secured by rivets or bolts to one another, said corrugations being continuous and, if desired, horizontal on one side and vertical on the other, or disposed in any relation to one another to reinforce each other and extending inwardly within the car or outwardly from the car.

It is also an important object of this invention to construct a double walled car end having a space between its walls to afford a heat insulating space or to receive a filling of insulating material therein.

It is furthermore an important object of this invention to provide a unitary double end structure for cars whereby one member serves to reinforce the other and so constructed that in the event of one member being already attached on the car another reinforcing member may be secured thereover, either on the interior or exterior of the car, to afford a double plate metal car end.

It is finally an object of this invention to provide an improved type of metal car end structure self-sustaining and capable of withstanding stresses applied on either side thereof, and not requiring auxiliary reinforcement members within or on the exterior of the car.

The invention (in a preferred form) is illustrated in the drawings and hereinafter more fully described.

In the drawings:

Figure 1 is an exterior end elevation of a car body equipped with an end embodying the principles of my invention.

Fig. 2 is a similar interior view of the car illustrating the walls, floor and roof of the car in section.

Fig. 3 is a fragmentary section taken on line 3—3 of Fig. 1.

Fig. 4 is an exterior view of the end of the car with another form of structure thereon.

Fig. 5 is an interior view thereof.

Fig. 6 is a detail section taken on line 6—6 of Fig. 4.

Fig. 7 is an exterior end view of a car equipped with another form of double end member.

Fig. 8 is an interior view thereof.

Fig. 9 is a detail section taken on line 9—9 of Fig. 7.

Fig. 10 is an exterior view of the end of a car provided with a one piece metal end and having an auxiliary end secured thereto to reinforce the same.

Fig. 11 is a fragmentary detail section taken on line 11—11 of Fig. 10.

Fig. 12 is a fragmentary detail section illustrating one method of association of a double plate end with the floor and end sill of a car.

Fig. 13 is a similar view illustrating another form of attachment.

Fig. 14 is another similar view illustrating still another modified form of connection.

Fig. 15 is a typical section similar to Fig. 11, of a modified form of construction.

Fig. 16 is a typical section similar to Fig. 15, of another modified form of construction.

As shown in the drawings:

As shown in Figs. 1, 2, and 3, the car body is denoted as a whole by the reference numeral 1, and attached on the end thereof is a double plate end comprising an inner plate 2, having circular or concentrically arranged corrugations increasing in depth successively from the outer edge of the plate toward the middle, and another similarly constructed outer plate 3, said plates arranged such that the inner corrugations of each plate contact one another, as clearly shown in Fig. 3, to permit attachment thereof by rivets 4, one to another. The margins of said respective plates are bent at right angles and lie flat against one another, and are bent around the end posts of the car body 1, and secured thereto in any suitable or convenient manner to afford a rigid attachment of said associated plates with the car.

In the form of device illustrated in Figs. 4, 5, and 6, the car body is denoted as before by the reference numeral 1, and a pair of inner vertically disposed end plates 5 and 6, are provided, with their central vertical margins riveted one to another by rivets 7, and secured on the exterior of the car over said vertically disposed corrugated plates 5 and 6, are similarly corrugated plates 8 and 9, which, however, are disposed horizontally

with the central connected margins of said outer row of plates secured by rivets 10, which also extend through said inner plates 5 and 6, as clearly shown in Fig. 5. The vertical row of rivets 7, which secure the central margins of said inner plates 5 and 6, together also extend through said horizontal exterior plates 8 and 9, as clearly shown in Fig. 4. The side margins of the respective inner plates 5 and 6, and outer plates 8 and 9, are laid flat against one another and bent around in right angled relation to the body or frame 1, of the car, as clearly shown in Fig. 6, and securely attached thereto in any suitable manner.

In the form of construction illustrated in Figs. 7, 8, and 9, I have shown attached to the car body or frame 1, an inner plate 11, the corrugations of which are disposed vertically over the entire surface thereof, and secured on the exterior of the car flat against said inner plate 11, is another plate 12, with the corrugations thereof extending horizontally over the entire surface thereof, and at points on said respective plates where the corrugations contact one another, rivets 13, are secured thereto to rigidly connect said plates one to another substantially as a unitary structure. As in the constructions before described, the side margins of said plate are laid flat against one another and bent around the corner posts of the car body and secured thereto in any suitable manner.

In the structure illustrated in Figs. 10 and 11, I have shown the car body 1, as already equipped with a transversely corrugated end plate 14, although the particular construction or shape thereof is immaterial and, for the purpose of reinforcing the same, I have shown another corrugated plate 15, mounted on the exterior thereof with rivets 16, extending through said respective plates at the points at which the corrugations contact one another, and although no marginal connections are shown between said plates, it is obvious that such may be provided if deemed necessary.

As shown in Fig. 15, the outer plate denoted as a whole by the reference numeral 20, is corrugated horizontally and inwardly relative the sheet, but outwardly relative the car and the inner plate 19, secured thereto is corrugated vertically and outwardly, that is inwardly with respect to the car. In Fig. 16, the outer plate denoted by the reference numeral 21, is corrugated horizontally and outwardly from the sheet and from the car and the inner plate 22, secured thereto is corrugated vertically and outwardly from the sheet.

In the constructions illustrated in Figs. 12, 13 and 14, I have shown different methods of connecting the lower margins of the plates to the car frame. In Fig. 12,

the margin of the outer plate, denoted by the reference numeral 17, is bent outwardly, and the margin of the inner plate, denoted by the reference numeral 18, is bent inwardly and each is secured independently to the car frame.

In Fig. 13, the construction illustrated shows the margins 17 and 18, of the plates laid flat against one another and secured between the frame members of the car body, whereas in Fig. 14, said margins 17 and 18, are laid flat against one another and both bent outwardly in right angled relation and secured upon the car frame.

The operation is thought to be obvious from the description. The corrugations in the plates serve to greatly strengthen the same in resisting stresses applied on either surface thereof, and it is obvious that where two plates are used the associated plates are capable of withstanding even more than twice that of either of the plates when used alone. The greater rigidity of the entire structure is due to the connection of the two plates at the different points thereof, which serves to distribute the stress from one plate to another when stress is applied upon either one of said plates. The double plate construction, as pointed out, may be as light or lighter in weight than the single heavy plate construction.

Another important feature of the double plate end is the provision of the air space between the plates, which may or may not be a dead air space, depending upon the particular type of construction, but the space, whether filled with a material or not, in any event serves as an insulating means to prevent rapid conduction of temperature changes through the car end.

Of course, while I have illustrated and described my invention for use as a car end, it is obvious from the construction described that it may be used as well for a car side or as a part of any metallic construction, if desired.

I am aware that various details of construction may be varied through a wide

range without departing from the principles of this invention, and I therefore do not purpose limiting the patent granted otherwise than necessitated by the prior art.

I claim as my invention:

1. A structure comprising, concentrically corrugated metal sheets with the corrugations of one of the metal sheets directed inwardly from the main surface and the corrugations of the other metal sheet directed outwardly from the main surface, and with said sheets secured to one another with the corrugations thereon registering to afford an air space between said sheets.

2. A structure of the class described comprising a pair of circularly and concentrically corrugated plates secured flat against one another affording a plurality of circular concentric air spaces therebetween, and with means secured to and through said plates between said air spaces to hold said plates attached to one another.

3. A structure of the class described comprising concentrically corrugated plates having circular corrugations, and with said plates laid flat against one another with the corrugations registering to afford circular air spaces between said plates, and attaching means secured through said plates to hold the same attached at contacting points of said plates between said circular air spaces.

4. A structure of the class described comprising plates having curved concentric corrugations therein of varying depth, said plates secured flat against one another with the corrugations in register to afford a plurality of air spaces circular and concentric with respect to one another, and each of different depth, and means securing said plates one to another.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

HERBERT E. VAN DORN.

Witnesses:

CHARLES W. HILLS, Jr.,
EARL M. HARDINE.