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PANEL STRUCTURE

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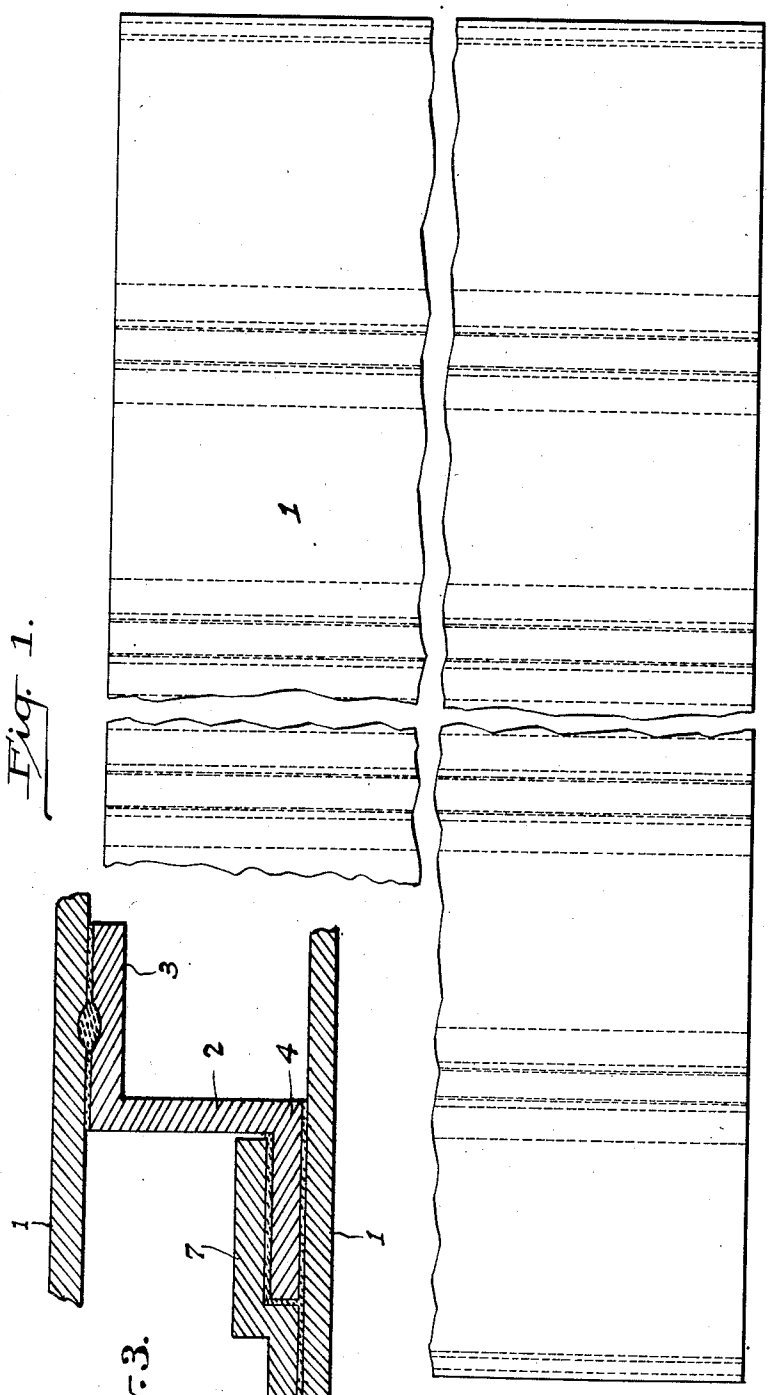


Fig. 1.

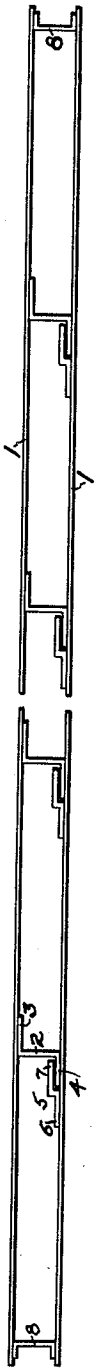


Fig. 2.

Fig. 3.

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PANEL STRUCTURE

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8 Claims. (Cl. 189—34)

This invention relates to panel structures, and particularly to the type generally referred to as bulkhead panels.

The structures of this invention are particularly well suited and adapted for use in car construction, especially where it is desirable that there be a minimum amount of noise, such as in Pullman cars. The art has endeavored to attain this desideratum, but quite generally structural stability has been sacrificed in arriving at a suitable sound-deadening unit, or the latter has been impossible to attain due to requirements of safety in car construction.

One object of this invention is to provide a panel structure which can be quickly and easily assembled without the necessity of employing special tools.

Another object is the provision of a firm, durable panel which possesses an inherent resiliency, permitting the panel to sustain pressure directed normally thereto without serious deformation.

A further object is to provide a panel structure having an insulation section which serves the double purpose of reducing heat conductivity through the panel, and also affords an extremely efficient sound-deadening unit, in that there is an absence of metal-to-metal contact between the various parts of the structure.

These and other objects of this invention will be apparent upon reading the specification and the accompanying drawing, wherein like numerals refer to like parts throughout, and wherein:

Fig. 1 is a plan view of the panel broken vertically and horizontally;

Fig. 2 is an end view of the panel shown in Fig. 1.

Fig. 3 is an enlarged fragmentary sectional view in detail.

Referring to the drawing, reference character 1 designates the metal sheets from which the panel is formed. Intermediate these sheets and equally spaced throughout the length of the panel are structural members 2, which act as strengthening means. As clearly shown in Fig. 2, members 2 serve an additional purpose in that they provide an air space between sheets 1, thereby reducing heat conduction through the structure. The stiffening members 2 may be of various forms, but the preferred form is the Z-type, as shown. The legs 3 and 4 of the stiffening members parallel the inner face of the sheet metal members 1. Immediately adjacent the legs 4 are brackets 5, one leg 6 of which is secured to the members 1, the other leg 7 being somewhat offset, as shown, and forming a recess or pocket with the sheet for the reception of the legs 4.

Prior to this invention, various means were employed for securing stiffeners between panel sheets. In some instances, they were secured directly to the sheet members by rivets, bolts, or spot welding, and resulted in a structure particularly susceptible to vibratory noise. In other instances, attempts have been made to form a unitary structure by using an adhesive only, and the results of such assembly have given perhaps a sound-proof structure, but surely a structure insufficient in strength.

This invention, however, provides a novel method of securing the various parts together, and affords a unitary structure in which there is no metal-to-metal contact between the panel sheets, except where the spots of the welds join the stiffeners to the sheets. The remaining area of contact between the stiffeners and sheets is covered with a resilient adhesive which surrounds the welds, thereby prohibiting the noise attendant upon contact of two flat metallic sheets with surprising effect.

The preferred method of securing the stiffeners to the sheets in the present invention consists of using a resilient adhesive, such as a relatively slow drying rubber cement, between certain of the parts thereof, and in spot welding through a resilient adhesive placed between certain of the other parts. Referring to the drawing, outer legs 3 of the Z-type stiffeners 2, and outer legs 6 of the brackets 5, are secured to opposite sheets 1 by placing a resilient adhesive between the respective members and spot welding the members together through the adhesive. Between the inner legs 4 of the stiffening members 2 and the inner legs 7 of the brackets 5 there is placed a resilient adhesive only. It will thus be appreciated that there is a layer of resilient adhesive between all adjacent members, thereby producing a structure having excellent characteristics for sound-deadening purposes.

At either end of the panel, channel members 8, as best shown in Fig. 2, serve to unitarily join the sheets, and are secured to the sheets by the same double bond as above described; namely, spot welding through a resilient adhesive placed between the legs of the members and opposite sheets.

I claim:

1. A sound-deadening panel structure comprising spaced and opposed sheets, co-acting structural stiffening members disposed between said sheets and secured thereto through the

medium of a resilient adhesive and spot welds, said welds extending through said resilient adhesive.

2. A sound-deadening panel structure comprising spaced and opposed sheets, co-acting structural stiffening members disposed between said sheets, means for securing said members to said sheets comprising a resilient adhesive and spot welds, said adhesive encircling said welds and completely covering the remaining area of contact between said members and said sheets.

3. A sound-deadening panel structure comprising spaced and opposed sheets, means for strengthening said structure comprising co-acting structural members secured to the oppositely disposed sheets through the medium of a resilient adhesive and spot welds, said welds extending through said resilient adhesive.

4. A sound-deadening panel structure comprising spaced and opposed sheets, co-acting structural stiffening members having parallel legs disposed between said sheets, one leg of each said member being secured to said opposite sheets through the medium of a resilient adhesive and spot welds, the remaining legs of said members forming a joint intermediate said other legs and secured together by a resilient adhesive.

5. A sound-deadening panel structure comprising spaced and opposed sheets, a structural shape having one of its parallel legs secured to the inner face of one of said sheets, a bracket having one of its parallel legs secured to the inner face of another of said sheets and forming a pocket with said sheet for the reception of the remaining leg of said structural shape, the outer leg of said structural shape and said bracket being secured to said sheets through the medium of a resilient adhesive and spot welds, the inner legs being bonded together through the medium of a resilient adhesive.

6. A sound-deadening panel structure comprising spaced and opposed sheets, co-acting structural stiffening members disposed between said sheets, means for securing said members together comprising a resilient adhesive, means for securing said members to said sheets comprising a resilient adhesive and spot welds, said adhesive encircling said welds and completely covering the remaining area of contact between said members and said sheets.

7. A sound-deadening panel structure comprising spaced and opposed sheets, means for strengthening said structure comprising intermediately disposed co-acting structural members secured to said sheets through the medium of a resilient adhesive and spot welds, said resilient adhesive encircling said welds and covering the remaining area of contact between said members and said sheets, thereby forming a resilient bond and sound-deadening film between the same.

8. A sound-deadening panel structure comprising spaced and opposed sheets, means for strengthening said structure comprising intermediately disposed co-acting structural members, means for securing said members together comprising a resilient adhesive, means for securing said members to said sheets comprising a resilient adhesive and spot welds, said resilient adhesive encircling said welds and covering the remaining area of contact between said members and said sheets, said adhesive thereby forming a resilient bond and sound-deadening film intermediate said sheets.

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