April 13, 1937. T. M. PRUDDEN 2,077,262

CEIL CONSTRUCTION FOR ROOFED VEHICLES

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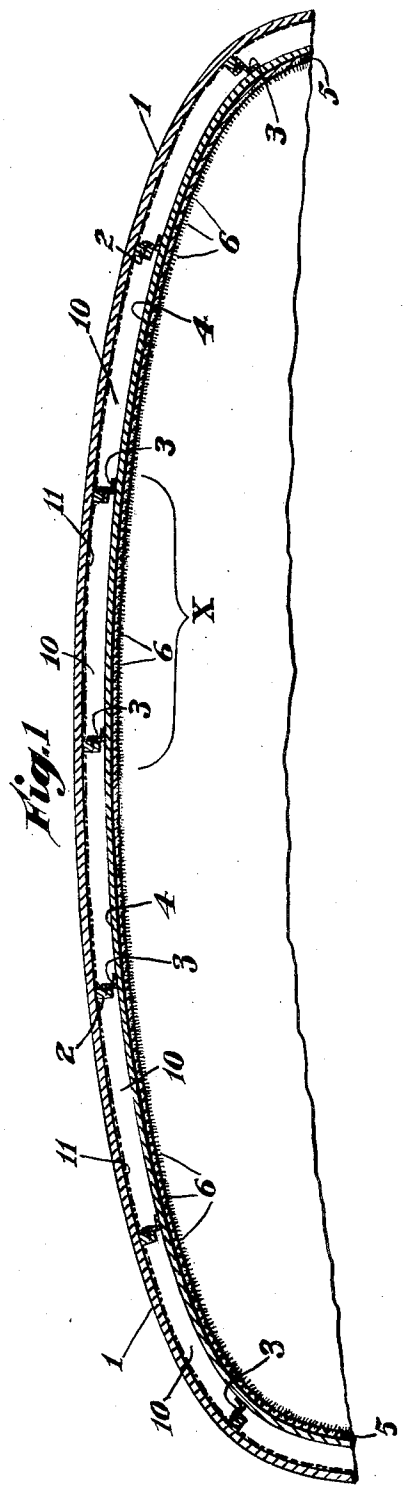


Fig.1

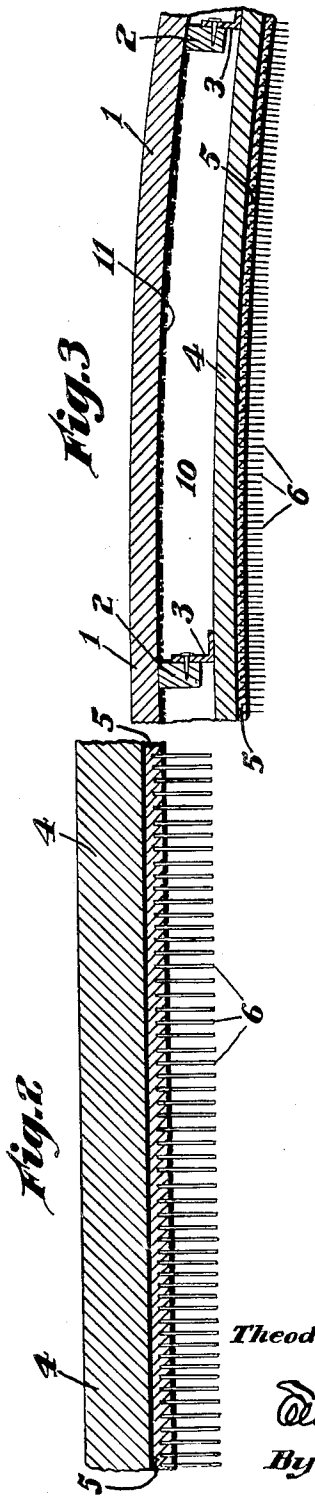


Fig.3

Fig.2

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CEIL CONSTRUCTION FOR ROOFED VEHICLES

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3 Claims. (Cl. 296—137)

My present invention relates to vehicle bodies and particularly those of automobiles constructed in whole or in part of sheet metal. Such structures, particularly in the tops or roofs, while otherwise very desirable, are subject to the development of annoying noise due to its audible vibration. To counteract this, some cars have been engineered with acoustic corrective material within the roof to absorb or reduce the vibration or effects of vibration within the car. Such materials being generally of a fibrous or like body and often impregnated or smeared as with asphalt for a stiffening, are unsightly, and necessitate a ceiling lining to make the car interior presentable and attractive.

I have discovered that the ordinary woven head lining as used as a ceiling of a car has considerable sound absorption, provided it is drawn tautly in its installation. Also, I have found that such head lining should be spaced away from the roof so that sounds penetrating the lining have an appreciable space to travel before they reach the roof.

I have discovered further that if a head lining is made of a pile fabric that its sound absorbing properties are increased, and one reason for this is because its surface is less sound reflecting. However, pile fabrics as made today often have the erected fibres held in place by a tightly woven backing sheet, which construction resists the passage of sound through the material, i. e. it is relatively sound impermeable. Therefore, I have discovered that if I apply these erected fibres to a backing sheet by a flocking process whereby the short surface fibres are held erect by a rubber coating applied to the exposed face of the sheet rather than weaving the fibres into the sheet as is customary with ordinary pile fabrics such as mohair or plush, and if in addition the backing sheet is of light weight open construction, then I have the acoustic benefits of a pile fabric without losing the sound permeable benefit of a woven fabric.

There is a further advantage in the use of a piled ceiling material in that the color of the backing sheet may be covered up by the flock without dyeing the backing sheet. In the flocking material described in my invention it is intended to use fibres of relatively short length, perhaps one millimeter in length. These fibres are so short that they will not of themselves readily hide the color of the underlying backing. Hence, unless some provision is made, this backing is likely to show when the cloth is stretched tautly. I obviate this difficulty by coloring the bonding cement to match or harmonize with the color of the fibres, which is a very inexpensive thing to do as compared with the cost of dyeing the backing sheet. With pile woven fabrics such cement as is used is applied to the back side of the cloth and cannot be utilized in hiding the color of the backing.

As used in this patent by the term "acoustic" I mean any acoustic-corrective, such as a sound absorber, a sound insulator or any panel dampener for reducing audible vibration.

As illustrative of my invention I have shown in the accompanying drawing an indicated embodiment in which I have had shown a metal roof construction of an automobile body ceilinged in accordance with my invention in its acoustical and screening relation thereto.

In the drawing:

Fig. 1 indicates in section a characteristic metal roof structure according to my invention.

Fig. 2 is an indicated magnified section of a ceil in accordance with my invention, and

Fig. 3 is an enlarged fragmentary section removed at bracket X on Fig. 1.

Referring to the drawing I have indicated at 1 the roof which may be of any desired construction, that shown being provided with bows or carlines 2.

To this may be tacked the listing or tacking strips 3 to which my ceil 4 may be attached as by sewing or otherwise attaching.

The interior of the roof cavity thus is defined as a head chamber 10. The interior of the roof 1 may be acoustically treated as with an asphaltic mixture of vibration dampening character usually containing fibre as suggestively indicated at 11.

The ceil is preferably composed of a flexible backing 4 for which I may conveniently use a light weight fabric of open weave. Such fabrics are inexpensively available as so-called "sheetings" or equivalent textile or like materials.

The surface pores of such a backing provide an excellent anchorage for my bond 5. This may be a rubber or like cementitious bond adapted to adhere tenaceously to the backing.

In this I set my surface flocking of fibre 6. These are deposited on and held by the bond in a more or less erect position. The flocking may be deposited while the bond is unset, and by agitation or otherwise I cause the fibres to flock to stand erect and form a nap-like or pile surface.

The term "flocking" as used herein is to be understood as inclusive of short length fibres applied in the manufacturing or finishing process of producing materials as by sprinkling the fibres

on a bonding surface and agitating, or erecting the fibres as by static excitement, so that they are held in whole or in large part erected in the bond on the backing when it is set.

What I therefore claim and desire to secure by Letters Patent is:

1. In a vehicle body structure, in combination with a metal roof, acoustic corrective material beneath the under surface of said roof, and a decorative and sound reflection reducing material comprising a flexible sheet adapted to be tautly drawn over the acoustically treated surface of such roof interior in concealing relation thereto, said sheet having cement on its exposed face, and having erected fibres flocked on and cemented to said exposed face.

2. The structure of claim 1, the erected fibres of the sheet being of insufficient length to wholly conceal the color of the bonding substance on the exposed face of the sheet and the bonding substance being of a color harmonizing with the color of the erected fibres.

3. The method of reducing the sound in the interior of a vehicle having a vibratory metal roof, which consists in acoustically treating the inner surface of the metal roof, in coating one face of a flexible ceiling sheet with a bonding substance, in flocking erected fibres on said coated face, and in tautly mounting said flocked ceiling sheet within the vehicle in spaced relation to the acoustic treatment of the metal roof and with the flocked face of the ceiling sheet disposed towards the interior of the vehicle.

THEODORE M. PRUDDEN.