Aug. 18, 1959 W. R. SHAVER 2,900,055

NAILABLE STEEL FLOOR FOR FREIGHT CARS

Filed Sept. 20, 1957

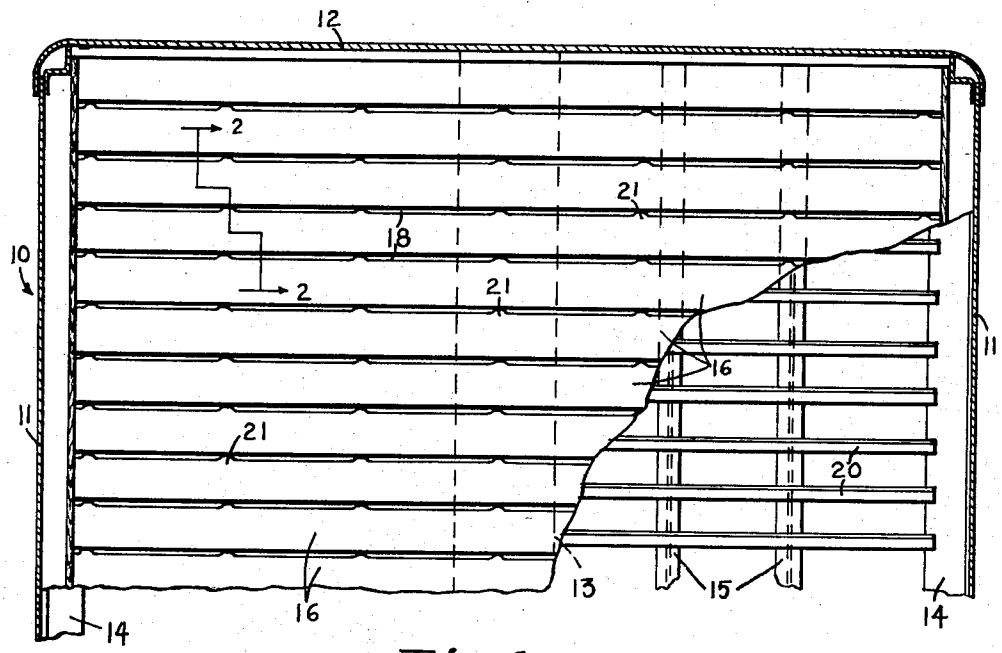


Fig. 1.

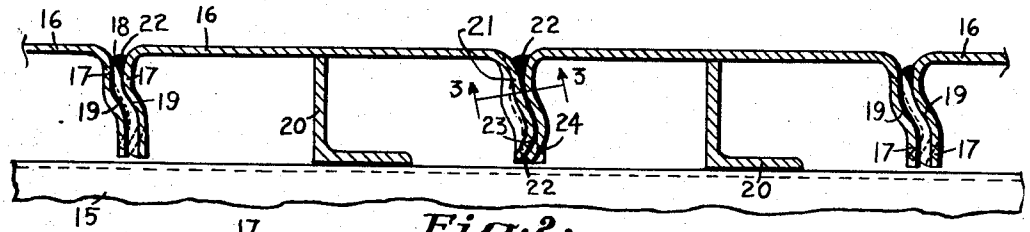


Fig. 2.

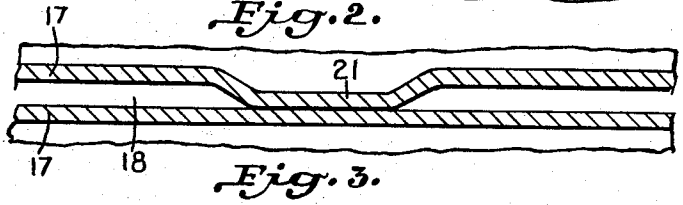


Fig. 3.

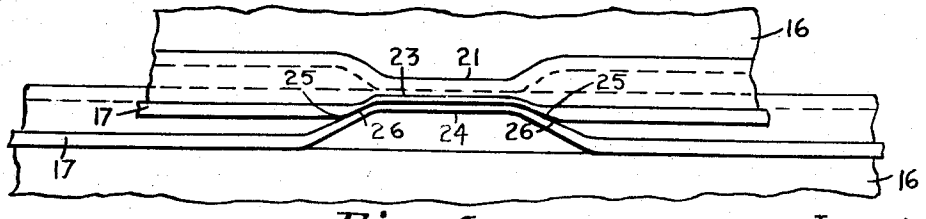


Fig. 4.

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Patented Aug. 18, 1959

2,900,055

NAILABLE STEEL FLOOR FOR FREIGHT CARS

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Application September 20, 1957, Serial No. 685,112

5 Claims. (Cl. 189—34)

This invention relates to nailable steel floors for railway freight cars and more particularly to an improved metal plank from which such floors are formed.

The invention has for its principal object the provision of a nailable metal floor wherein the adjoining planks mutually support each other to relieve the attachments of shear stresses.

An important object of the invention is the provision of a nailable metal floor wherein the adjoining planks are positively interlocked to prevent relative vertical displacement.

Another object of the invention is to provide a nailable metal floor wherein the adjoining planks interengage at their edges to limit relative displacement longitudinally of the planks.

A further object of the invention is to provide a nailable metal floor comprised of adjoining planks secured by welding wherein the planks are interlocked to relieve the welds of shear stresses and positively prevent relative vertical displacement of the adjoining edges of the planks.

The foregoing and other and more specific objects of the invention are attained by the construction and arrangement illustrated in the accompanying drawings wherein—

Fig. 1 is a general plan view of a portion of a railway box car equipped with a nailable steel floor of the type covered by this invention.

Fig. 2 is a stepped cross-sectional view through the floor taken on the line 2—2 of Fig. 1 showing an interlocking joint between the flanges of adjoining planks to prevent relative vertical displacement of the planks.

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2 showing the spacer portion between adjoining planks above the interlocking portion of the joint; and,

Fig. 4 is a bottom edge view of the interlocked joint showing the association of the parts to prevent relative displacement longitudinally of the planks.

This invention relates to a nailable steel floor construction of the type covered in co-pending application for patent, Serial 521,858 for vehicle floor construction wherein the floor is comprised of a plurality of adjoining channel section metal planks having depending marginal flanges with the flanges supported clear of the underframe structure by means of supporting members disposed intermediate the flanges of each plank. The invention provides a combined integral spacer embossment on one flange of each plank and an interlocking embossment on the other flange so that when the opposed flanges of adjoining planks are brought together the planks are not only properly spaced to provide a nailing groove of the correct width but are interlocked and mutually supported by each other to relieve the connecting attachments of shear stresses and prevent relative vertical displacement as well as to limit relative displacement longitudinally of the planks.

In the drawings, 10 represent a railway box car having side and end walls 11 and 12, and an underframe structure including center sill 13, side sills 14 and intermediate longitudinal stringers 15. The nailable steel floor is supported directly on the underframe longitudinals and consists of a plurality of juxtaposed steel planks 16 extending transversely of the underframe and continuously from side sill to side sill. The floor planks 16 are each provided with depending marginal flanges 17, extending continuously along the respectively opposite side edges and when the planks are assembled in the car to form the floor, the flanges on adjacent planks are disposed in spaced relation sufficient to afford a nailing groove 18 between the planks and, as best shown in Fig. 2, the depending flanges 17 at each groove are offset at 19 to clinch the nails that are driven into the grooves. The bottom edges of the flanges 17 do not contact any of the underframe members 13, 14, or 15 but are supported clear of these members by intermediate angle members 20 disposed respectively under each plank and coextensive therewith. The angle members are supported directly on all of the underframe longitudinal members and secured by welding and the upstanding flange of the angle engages the underside of the horizontal web of the respectively associated floor plank member to which it is secured by welding and forms the sole attachment of the plank to the underframe. The upstanding flange of the support angle is of greater length than the depending flanges 17 on the planks so that the flanges are supported clear of the underframe members.

The spaced relation of the floor plank members 16 to provide the nailing grooves 18 is maintained by means of integral spacer embossments 21 formed in one flange 17 of each plank in position to abut the opposing flange on the adjacent plank. The opposing flange overlies a portion of the embossment to prevent relative vertical movement in one direction and the adjoining planks are secured together by welding 22 at the top and bottom of the flanges 17 where they abut as best shown in Fig. 2. Combined with spacer embossment 21 a reversely bent embossed portion 23 in the offset portion adjacent the lower area of the depending flange 17 cooperates with a complementally reversely curved embossment 24 in the offset lower portion of the opposed flange 17 on the next plank to complete the interlocked relationship between the adjoining flanges whereby the planks are mutually supported at their side edges, one by the other, and are prevented from being displaced vertically in either direction with respect to each other so that the horizontal top surfaces of the various planks 16 are maintained in an aligned plane affording an even floor surface. Looking at Fig. 2 it will be seen that the interlocked association of the adjoining flanges 17 afforded by the interengaging portions 23 and 24 not only supports the side edge portion of each plank from the other and prevents relative vertical displacement thereof but also eliminates the transfer of shear stresses to the connecting welds 22. Looking at Fig. 4 it will be seen that the engagement of the reversely bent portions 23 and 24 is such as to limit relative displacement of the planks 16 lengthwise of each other. The abutments afforded by the sloping side wall surfaces 25 and 26 at the opposite sides of the embossments act as a positive limit to any shifting of the respective planks lengthwise of the other.

In the practice of the invention the individual floor plank members 16, which are comparable to individual floor boards, are assembled prior to application in the car into pre-assembled planks consisting of several of the individual members 16 integrally secured together by the welds 22 which assembled planks may be brought to the

erection location and applied to the car as units. These units are placed on the underframe of the car 10 in juxtaposed relation and jacked into position to form the floor of the car. The interengaging relationship of the reversely bent interlocking portions 23 and 24 on the respective edges of the pre-assembled plank units as they are brought together act positively to prevent the pre-assembled units from climbing up or riding over each other during the application thereof to the car and maintain the horizontal alignment of the units for welding to each other and to the car structure. Upon completion of the operation of jacking the floor plank units into position on the underframe, the units are secured together by welds and the supporting members 20 are welded to the various underframe members to provide a floor structure integrated with that of the car.

From the foregoing it will be seen that there has been provided a nailable steel floor for vehicles wherein the floor is comprised of individual channel section members pre-assembled into plank units having a plurality of nailing grooves with each member interlocked with adjoining members to prevent relative displacement at the grooves and wherein the units have similar interengaging edge portions which prevent misalignment of the units during application thereof to a vehicle underframe.

What is claimed is:

1. In a nailable steel floor comprised of juxtaposed metal members each having a horizontal web and a depending flange at one side edge of the web, said depending flanges being disposed in opposed spaced relation to provide a nailing groove therebetween, one of said flanges having a spacer embossment thereon extending toward the other flange in said groove, said other flange having a portion overlying said embossment whereby to prevent relative vertical displacement of the members in one direction, said embossment having a reversely bent portion, and a reversely bent portion in said other flange complemental to said first-named reversely bent portion, said reversely bent portion in said other flange underlying said embossment whereby to prevent relative vertical displacement of the members in another direction.

2. In a nailable steel floor comprised of juxtaposed metal members each having a horizontal web and a depending flange at one side edge of the web, said depending flanges being disposed in opposed spaced relation to provide a nailing groove therebetween, one of said flanges having a spacer embossment pressed outwardly toward the other flange in said groove, said other flange having a portion overlying said embossment whereby to prevent relative vertical displacement of the members in one direction, a weld between said embossment and the adjacent member securing said members together, said embossment having a reversely bent portion, and a reversely bent portion in said other flange complemental to said first-named reversely bent portion and in said groove, said reversely bent portion in said other flange underlying said embossment, whereby to prevent relative vertical displacement of the members in another direction and provide an interengaged relationship between the adjacent members to relieve said weld of vertical shear stresses.

3. In a nailable steel floor comprised of juxtaposed channel members each having a horizontal web and depending flanges at the respective side edges of the web, said members being spaced apart to provide a nailing groove between the opposed flanges of the adjacent members, one of said opposed flanges having an offset below said web coextensive with the length of the member, the

other of said opposed flanges having an offset complemental to the first-named offset to provide an offset portion in said groove, means spacing said flanges apart comprising an embossment on the one flange adjacent the upper side of said offset and extending toward the other flange in said groove, said other flange having a portion overlying said embossment whereby to prevent relative vertical displacement of the members in one direction, said embossment having a reversely bent portion adjacent the lower side of said offset, and a reversely bent portion in said other flange below said offset and complemental to said first-named reversely bent portion, said reversely bent portion in said other flange underlying said embossment whereby to prevent relative vertical displacement of the members in another direction.

4. In a nailable steel floor comprised of juxtaposed channel members each having a horizontal web and depending flanges at the respective side edges of the web, said members being spaced apart to provide nailing grooves between the opposed flanges of adjacent members, each of said flanges on each member having an offset below said web coextensive with the length of the member and each of the opposing flanges on each adjacent member having a complemental offset to provide an offset portion in each of said grooves, means spacing said members apart at each groove comprising an embossment on one of said flanges adjacent the upper side of said offset and extending toward the opposing flange in said groove, said other flange having a portion overlying said embossment whereby to prevent relative vertical displacement of the members in one direction, said embossment having a reversely bent portion adjacent the lower side of said offset, and a complemental reversely bent portion in said opposing flange below the offset whereby to prevent relative vertical displacement of adjacent members in another direction, said reversely bent portions having side wall surfaces in opposed relation whereby to limit relative lengthwise displacement of said members.

5. In a nailable steel floor comprised of a plurality of juxtaposed channel members each having a horizontal web and depending flanges at the respective side edges of said web, said members being spaced apart to provide nailing grooves between the opposed flanges of adjacent members, each of said flanges on each member being offset below the web and each of the opposing flanges on each adjacent member being complementally offset to provide said nailing grooves with offset portions to crimp nails driven therein, means spacing said members apart at each said groove comprising an embossment on one of said flanges at one side of said offset extending toward the opposing flange in said groove, said other flange having a portion overlying said embossment whereby to prevent relative vertical displacement of the members in one direction, said embossment having a reversely bent portion adjacent the other side of said offset, and a complemental reversely bent portion in said opposing flange at said last-named side of the offset, said reversely bent portion in said other flange underlying said embossment whereby to prevent relative vertical displacement of the members in another direction.

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