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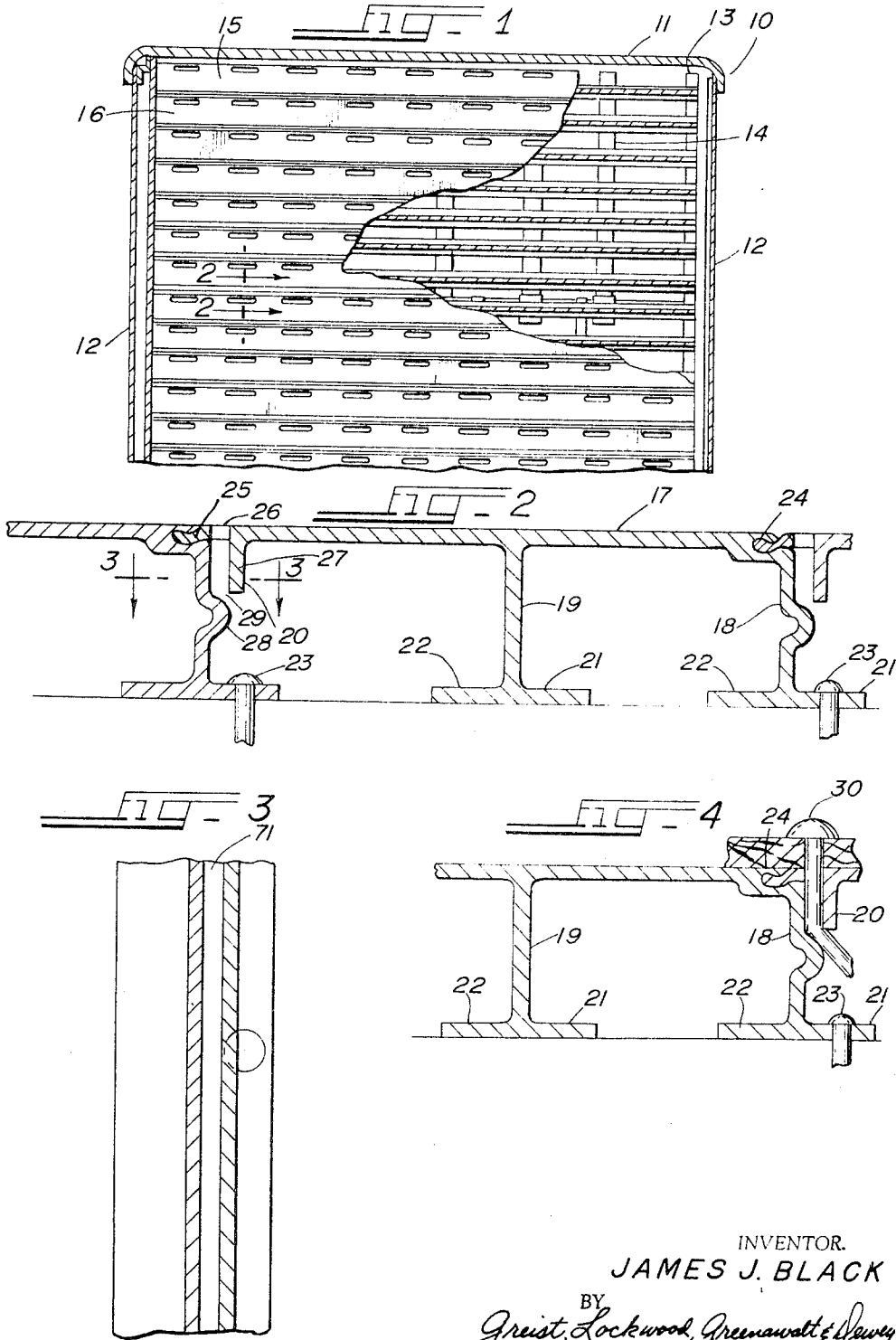
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VEHICLE FLOOR CONSTRUCTION

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2 Sheets-Sheet 1



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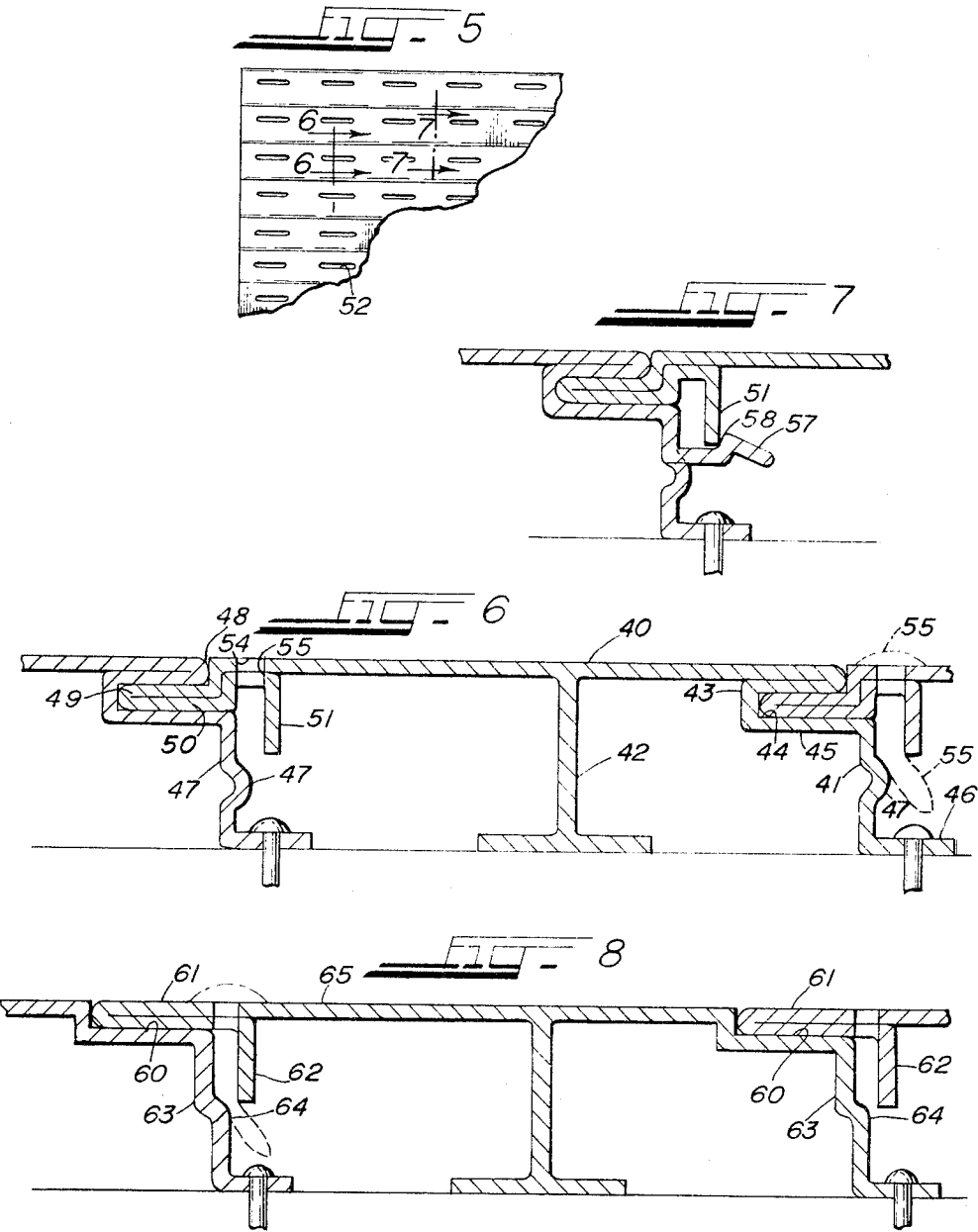
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2 Sheets-Sheet 2



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VEHICLE FLOOR CONSTRUCTION

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12 Claims. (Cl. 52-377)

This invention relates to a metal floor construction in general and more specifically is directed to a sectional interlocking metallic floor provided with nailing grooves which is particularly suitable for freight hauling applications such as in railway freight cars and the like.

In its broadest sense the invention contemplates a series of metallic planks which interlock, each with the other to form a smooth, rugged and extremely durable freight hauling surface. A tongue is provided on one edge of the plank with a groove formed on the opposite edge which cooperates with the tongue on the adjoining plank. A series of elongated nailing slots are punched out in the plank adjacent the edge having the tongue. When the planks are interfitted, depending flanges on the underside of adjacent planks form a groove substantially in line with the nailing slot. A ridge on one flange curls toward the abbreviated adjacent flange to provide a nail clinching means. Thus when a fastener such as a nail is driven in one of the elongated slots, as the nail advances, the lower extremity thereof is bent laterally between the ridge and the flange to clinch the same between the ridge and flange. The limited extent of the elongated slot minimizes the amount of lateral shifting, if any, that could occur, thus avoiding one of the major deficiencies existing in the known prior art.

The novel manner in which the nailing slot and clinching means is formed serves to minimize the metal required in manufacture of the planks since one of the supporting flanges also serves to assist in clinching and holding the fasteners in place.

It is therefore an object of this invention to provide a new and improved metallic floor construction utilizing a plurality of planks which interfit each with the other.

It is a further object of this invention to provide a metal floor composed of a plurality of planks having a series of unique elongated nailing slots to accommodate fastening of lading straps, planks, anchors and the like which are common to freight hauling.

A further object of this invention is to provide a new and improved form of a metal plank which may be economically and conveniently manufactured as well as expediently assembled.

It is a further object of this invention to provide a novel locking means which automatically locks adjacent planks when the joints thereof are interfitted.

It is a further object of this invention to provide a metallic floor construction which minimizes the amount of metal required without detracting from the strength of the completed floor.

Further and fuller objects will become readily apparent when reference is made to the accompanying drawings wherein:

FIGURE 1 is a fragmentary plan view of the floor with parts broken away to show a portion of the supporting underframe.

FIGURE 2 is an enlarged cross sectional view taken along the lines 2—2 of FIGURE 1.

FIGURE 3 is a view taken along lines 3—3 of FIGURE 2.

FIGURE 4 is a fragmentary view similar to FIGURE 2 showing a fragmentary portion of a plank or board nailed in the nailing groove.

FIGURE 5 is a fragmentary portion of the floor similar to the one shown in FIGURE 1.

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FIGURE 6 is an enlarged cross sectional view taken along line 6—6 in FIGURE 5.

FIGURE 7 is an enlarged cross sectional view taken along the lines 7—7 of FIGURE 5.

FIGURE 8 is a fragmentary cross sectional view of a modified form of flooring with a nail shown in phantom in the left hand nailing groove.

Referring now to FIGURE 1, reference character 10 indicates fragmentary plan view of a freight hauling vehicle such as a railroad car. For convenience of description the car shown is the house-car type and includes an end wall 11 and sidewalls 12 shown in section. The underframe of the car (only partially shown) is composed of a series of supporting members which are referred to in the art as a sideframe 13 and stringers 14. The entire underframe may be fabricated and assembled by suitable means such as welding to provide an integrated assembly.

The metal floor of the instant invention is indicated generally at 15 and is comprised of a plurality of inter-fitted juxtaposed metal floor planks 16. The floor planks 16 extend transversely of the vehicle or at right angles to the underframing to lend rigidity to the supporting portion.

The metallic floor planks are generally E-shaped in cross section with the flanges of the E extending downwardly in order to expose the back of the E upwardly providing a flush surface throughout the interior area of the vehicle. As shown in cross section in FIGURE 2, the floor portion is indicated at 17, being the back (or floor part) of the E, with the upper flange (or outer flange) at 18, middle flange (or intermediate flange) at 19 and a base flange (or other outer flange) at 20. Each of the upper and middle flanges have end flanges 21 and 22 extending at right angles thereto to provide a pad to distribute the load as well as facilitating fastening the plank to the underframing in any suitable manner such as by means of a rivet shown fragmentarily at 23. An egg-shaped groove 24 is provided adjacent the inner section of the upper flange 18 in the back 17. The groove 24 receives a cooperating tongue 25 projecting from the base of E substantially co-extensive with the back 17. The upper side (outer part) of the tongue 25 is of an egg-shaped configuration which conforms to that of the groove, with the lower side (or inner part) of the tongue being substantially planar and co-extensive with the underside of back. Insertion of the tongue into the groove is accomplished by the plank being at a slight angle to the adjacent plank when the tongue is inserted in the groove. It is then rotated into engagement with under-carriage causing the tongue and groove to be interlocked against lateral shifting. Removal is achieved by rotating the grooved edge of the plank a few degrees and sliding the tongue from the groove.

Nailing grooves are provided at spaced intervals and take the form of elongated slots 26 for purposes hereinafter to become apparent. The slots 26 are punched or formed adjacent the tongue 25 with one side thereof substantially co-extensive with the upper flange of the adjacent plank when the tongue is positioned in the groove. The opposite side of the groove is co-extensive with the inside of the lower flange 27, the two flanges forming a continuous slot 71 as clearly seen in the cross sectional view of FIGURE 3. The upper flange 18 is provided with a ridge 28 which curls into the slot 71 formed by the flanges 27 and 18 in the terminus region of flange 27.

As is more clearly seen in FIGURE 4, when a fastener such as the nail indicated at 29 is inserted in the slot and driven home, the ridge 28 and lower extremities of flange 27 cooperate to bend the nail laterally which is

more commonly referred to as clinching. The cooperating end of the flange 27 and the ridge 28 serve to grip the nails to an extent necessary for good holding power, however, permit extraction by a suitable tool such as a wrecking bar without damage to the floor members, or breakage of the nails.

The unique construction of the nailing groove permits any fastener which is accidentally broken off therein to be pushed through the nailing slot by a subsequent fastener. Lateral sliding of the nail is prevented since it will engage the arcuate ends of the slot after a minimum of lateral travel. The nailing grooves permit fastening of lading bands, support blocks, planks and the like to the vehicle floor repeatedly with no deleterious effect thereon as was the case with wooden floors. Once the nail is inserted any tendency to move laterally will bring it into engagement with the arcuate ends of the slot 13 which precludes further movement.

A modified form of construction is shown in FIGURES 5-7. The planks are also generally E-shaped cross section with the back indicated at 40, the upper flange at 41, middle flange at 42, and lower flange at 51. The back or floor forming portion 40 is reversely bent at 43 to form one side of a groove 44 and then again reversely bent as at 45 to form the other side of the groove 44. The side 45 is sharply bent at a right angle to form the flange 41, and again bent at a right angle to form the supporting flange portion 46 which facilitates fastening the plank to the underframe. A ridge 47 is formed in the flange 41 between the flanges 45 and 46 for purposes hereinafter to become apparent. The lower extremity of the back 40 is bent downwardly to form a shoulder 48 and further bent at a right angle to the shoulder to extend generally parallel to the back 40 forming one side of a tongue 49. The tongue is completed by the sheet being reversely bent upon itself as at 50 following the general S-shaped contour of the shoulder forming portion 48, and terminating in a flange 51 which depends from the underside of the floor portion.

A series of spaced, elongated nailing slots 52 are provided in each of the planks adjacent the tongue portion having one side of the slot 53 substantially co-extensive with the lower flange 51, while the opposite side of the slot 54 is substantially co-extensive with the upper flange 41 on the adjacent plank. The ridge 47 curls into the extension of the slot formed by the flanges 41 and 51 so that insertion of a nail such as the one shown in phantom at 55 causes it to bend laterally as at 56 to perform the holding function. When the nail 55 is driven to the position shown, the lower end of the flange 51 is flexed slightly so that the corner thereof bites into the fastener to securely hold the same in place. The biting action of the flange may be overcome for removal by a suitable nail puller or the like.

The modification illustrated in FIGURES 5-7 may be provided with a self-locking tab indicated generally at 57 in FIGURE 7. The locking tab 57 cooperates with the lower flange 51 to hold the tongue within the groove at all times. Removal is achieved by depressing the resilient locking tab 57 which allows lateral removal of the plank should it become necessary to replace the same. Insertion is achieved by aligning the tongue with the groove and moving it towards the bottom of the groove. As it progresses the flange 51 depresses the locking tab 57 and seats against the shoulder 58 being securely locked thereby. The locking tabs are punched from the flange 41 between the ridge 47. If it is desirable to fasten adjacent planks as by tack-welding the locking tabs may be omitted.

The modification shown in FIGURE 8 is similar to the modification of FIGURE 6, however the groove is an open sided or rabbet groove 60 formed by an offset in the back 65. The tongue 61 which cooperates with the groove 60 is a reversely bent double thickness of metal which terminates in the base flange 62. When

the planks are joined flange 62 cooperates with the upper flange 63 on the adjacent plank to form the sides of the nailing slot. In the modification of FIGURE 8 a ridge 64 is formed by an offset in the flange 63 which curls towards the slot in the same approximate plane where the flange 62 terminates in an analogous manner to the prior described modifications. The tongue 61 may be held in the groove 60 by tack-welding as at 70 or other acceptable forms of fastening.

While the tongue 61 has been formed by reversely bending the floor portion 65 upon itself, it is obvious that it could be integral if it were desirable to extrude the plank. Similarly the base flange 62 would be integral in a manner similar to that shown in FIGURE 1 in the event that it is desirable to extrude the plank sections. Any suitable metal having good strength characteristics may be used in forming the planks. It is contemplated that the extruded planks of FIGURES 1-4 be formed of easily extruded metal such as aluminum. The other modifications could be formed from sheet steel or the equivalent, unless it is desirable to extrude the same, then the previously mentioned material would be more satisfactory.

Although the invention has been shown in connection with but a few embodiments, it is not intended that these embodiments nor the terminology employed in describing the same be limiting inasmuch as such was done in the interest of clearly describing the invention. It is intended however that the scope of the invention be ascertained by the spirit and scope of the appended claims.

I claim:

1. A freight vehicle floor comprising a plurality of juxtaposed planks, each of said planks comprising a floor part and transverse opposed end flanges, groove means adjacent the intersection of the one flange and the floor part, tongue means extending from said floor part adjacent the other flange thereof, said tongue means being adapted to fit in the groove means of an adjacent plank, a series of elongated slots in said floor part between said tongue means and said other flange, said one flange of one plank and said other flange of an adjacent plank forming an extension defining the sidewalls of each of said elongated slots when said planks are interfitted, one of said flanges having ridge means thereon curling into said slot while the other of said flanges terminates in region of said ridge.

2. The vehicle floor of claim 1 wherein said groove means comprises a rabbet groove and said ridge means comprises an offset portion in one of said flanges.

3. The vehicle floor of claim 1 wherein said tongue means is offset slightly from the plane of said floor part and said groove means is offset a corresponding amount.

4. The vehicle floor of claim 1 wherein said groove means is generally egg-shaped in cross section, and said tongue means is generally egg-shaped on the outer part with the inner part being substantially planar thereby to lock said planks when said tongue means is received in said groove.

5. The floor construction of claim 3 wherein a locking tab is provided on one of said flanges of one of said planks between said slots, said locking tab cooperating with the flange terminating in the region of said ridge means to securely lock said planks together.

6. A freight vehicle floor construction, including a plurality of planks, tongue means on one of said planks interfitting with groove means on an adjacent plank, each of said planks having the upper surface thereof substantially co-extensive with the next adjacent plank when said tongue means is positioned in said groove means, a first flange depending from the underside of one of said planks, a second flange depending from the underside of said adjacent plank in spaced relation to the flange on said one of said planks, an elongated slot extending through the upper surface of one of said planks,

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said slot being positioned between said flanges, and ridge means on one of said flanges extending toward the other of said flanges, said other flange terminating in the region where said ridge begins.

7. The floor construction of claim 6 wherein locking means is provided on one of said planks to cooperate with the other flange on the next adjacent plank, said locking means including a resilient tab extending between said slots, said tab having an inclined portion to cooperate with said other flange to automatically lock said planks together when said planks are being inter-

8. The floor construction of claim 6 wherein said groove means comprises a generally egg-shaped groove with the cooperating tongue conforming to the groove configuration above a plane passing through the lowermost portion of the groove.

9. The freight vehicle floor construction of claim 6 wherein said tongue means forms a portion of the upper surface of the plank carrying said tongue means.

10. The freight vehicle floor construction of claim 6 wherein said tongue means is offset from said upper surface of said plank thereby to form a shoulder which abuttingly engages a conforming surface on an adjacent plank when said tongue means is interfitted in said groove means.

11. A nailable plank for use in conjunction with associated nailable planks in a cargo carrying vehicle, said plank having first and second edge portions disposed in substantial parallelism, a tongue projecting from one

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edge portion and a groove formed in the other edge portion, an elongated nailing slot formed adjacent said tongue carrying edge and each of said edge portions adapted to form with the edge portions of associated planks, groove means communicating with the slot and a portion offset with respect to said slot thereby to bend a nailing means inserted through said nailing slot.

12. A nailable plank for use in a cargo carrying vehicle including a tongue projecting from one edge of said plank and a groove formed in the other edge of said plank, said tongue being of greater length than said groove in being adapted to space the plank from an associated adjacent plank, an elongated nailing slot formed in said plank adjacent one of said edges, and means on one of said edges being adapted to extend toward the axis of the slot of the other edge of the associated plank thereby to bend a nail laterally when it is inserted through said slot.

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