

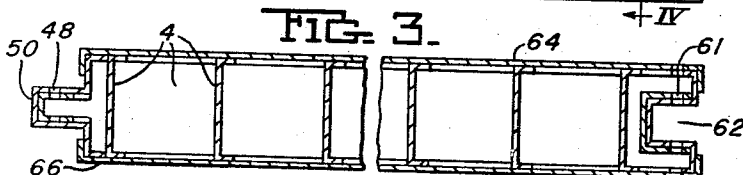
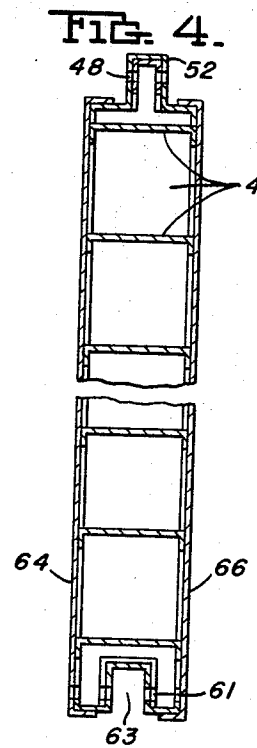
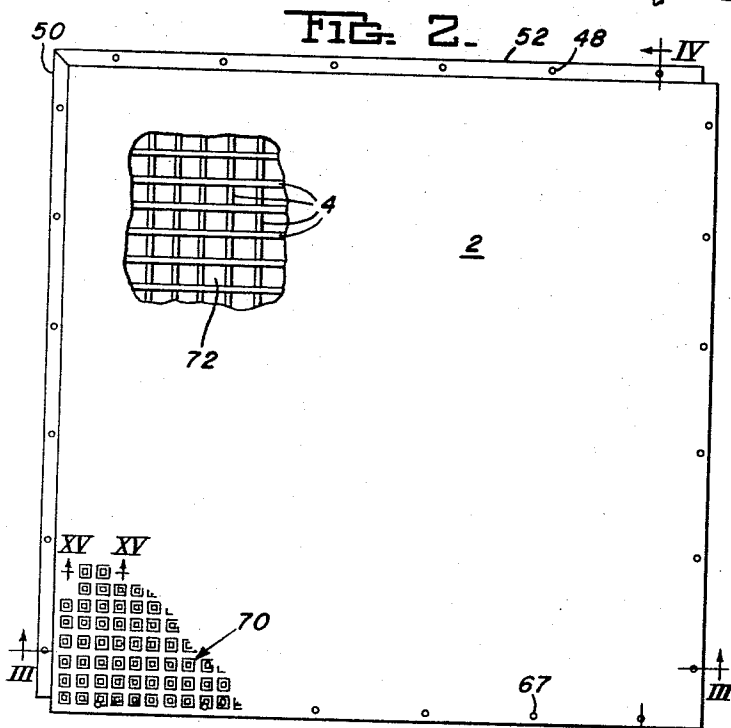
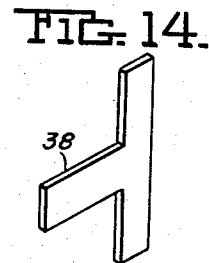
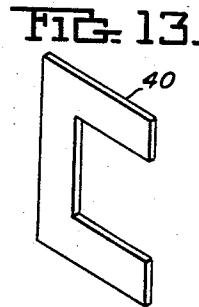
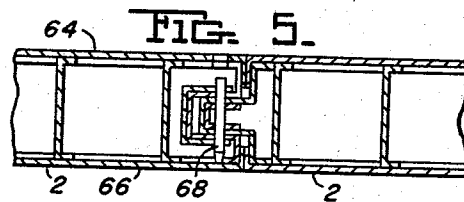
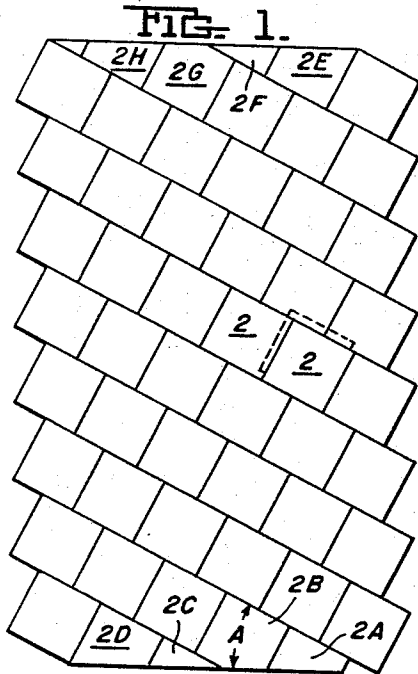
April 25, 1967

W. A. BOX
PORTABLE DECK

3,315,577

Filed April 7, 1966

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

FIG. 6.

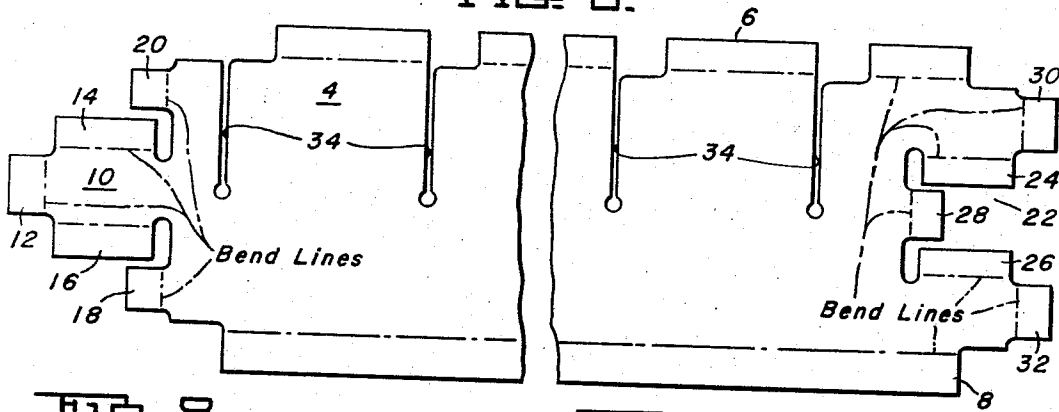


FIG. 8.

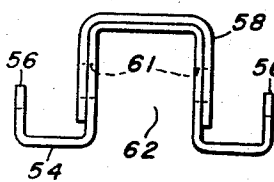


FIG. 7.

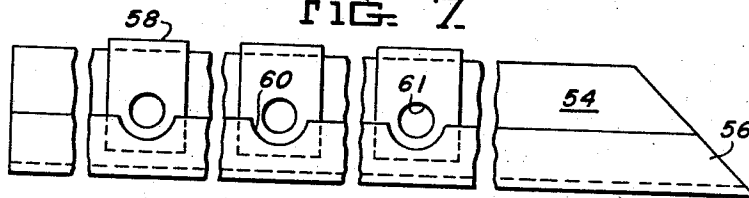


FIG. 9.

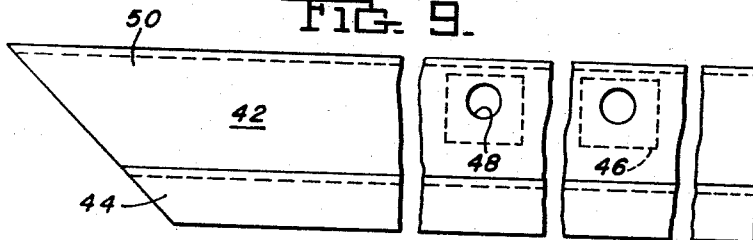


FIG. 10.

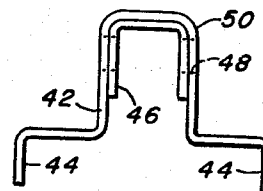
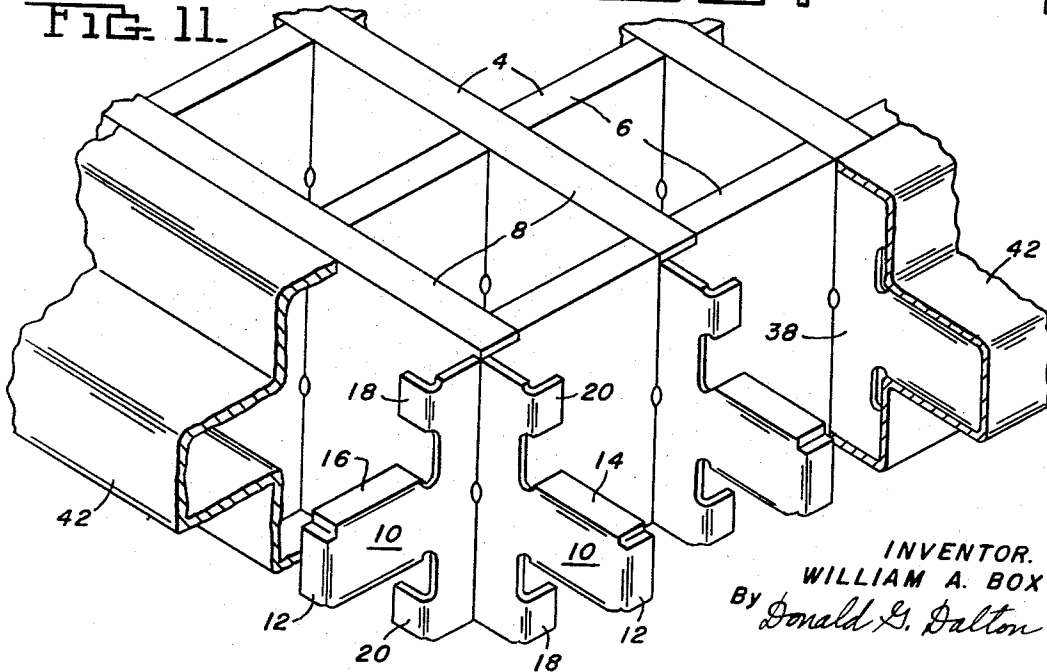


FIG. 11.



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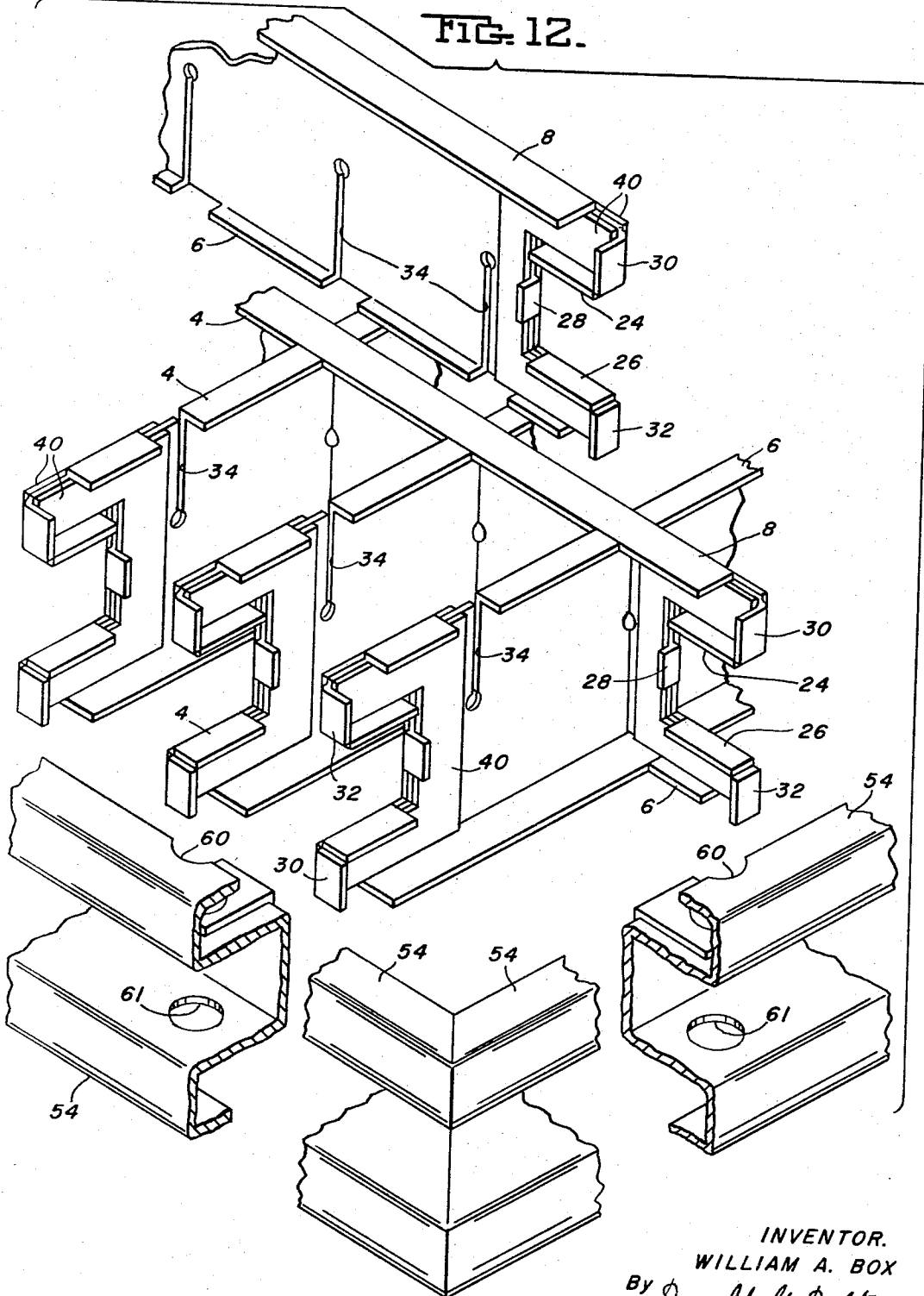
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3 Sheets-Sheet 3



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3,315,577

PORTABLE DECK

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Filed Apr. 7, 1966, Ser. No. 541,012
6 Claims. (Cl. 94-13)

This application, which is a continuation-in-part of my co-pending application Ser. No. 336,294, filed Jan. 7, 1964, relates to a portable deck and more particularly to a portable deck made up of a plurality of mats for use as a landing field for airplanes. While the portable deck disclosed in my co-pending application is satisfactory for many purposes it has been found that its strength is not sufficient for very severe service unless its weight is increased beyond that desirable. I have found that the strength of the mat can be increased as much as 15% without increasing its weight by providing concave depressions in the top sheet thereof with each of the depressions being within one of the cellular openings of the core of the mat.

It is therefore an object of my invention to provide a portable deck which is easy to assemble and which can withstand heavier loads than previous decks of the same weight.

Another object is to provide a mat for use in a portable deck or the like which is strong and light enough to permit manual handling.

These and other objects will be more apparent after referring to the following specification and attached drawings, in which:

FIGURE 1 is a schematic plan view showing a portable deck;

FIGURE 2 is a plan view, with a part broken away, showing a mat of the invention;

FIGURE 3 is a view, on an enlarged scale, taken on the line III-III of FIGURE 2;

FIGURE 4 is a view, on an enlarged scale, taken on the line IV-IV of FIGURE 2;

FIGURE 5 is a sectional view showing a connection between two mats;

FIGURE 6 is a developed view of a sheet used in the mat of FIGURE 2;

FIGURE 7 is a view showing a detail of the mat;

FIGURE 8 is an end view of FIGURE 7;

FIGURE 9 is a view showing another detail of the invention;

FIGURE 10 is an end view of FIGURE 9;

FIGURE 11 is a perspective view showing one corner of the mat with parts broken away;

FIGURE 12 is an exploded perspective view showing another corner of the mat;

FIGURE 13 is a perspective view of a detail;

FIGURE 14 is a perspective view of another detail; and

FIGURE 15 is an enlarged sectional view taken on the line XV-XV of FIGURE 2.

Referring more particularly to the drawings, reference numeral 2 indicates a mat used in assembling the portable deck of my invention. It is preferred that the mat have a square configuration. One particular mat is 48 in. square and 2 in. thick and includes forty-eight steel plates 4 which are preferably made of No. 20 gauge United States Steel Corten which is a high strength low alloy steel having a minimum yield point of 50,000 p.s.i. Each of the plates 4 has longitudinal flanges 6 and 8 one along each edge, a projection 10 having an end flange 12 and longitudinal flanges 14 and 16, end flanges 18 and 20 adjacent the projection 10, a cut out portion 22 at the end opposite projection 10, longitudinal flanges 24 and 26 on each side of the cut out portion 22, a flange

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28 at the base of the cut out portion 22, and end flanges 30 and 32. All of the flanges extend outwardly at an angle of 90° in the same direction from the plate 4. Twenty-four transverse slots 34 extend from one edge of the plate 4 to the center thereof. The plate 4 is shown prior to bending in FIGURE 6. Half of the plates 4 are arranged with their slots 34 upwardly and the other half arranged at right angles thereto with their slots 34 downwardly and are connected together at the slots 34 with the projections 10 extending along two adjacent sides of the mat 2 and the cut out portions 22 adjacent the other two sides of the mat. It will be seen that the combined length of the slots in the intersecting plates is at least equal to the height of the plates between top and bottom flanges.

A T-shaped plate 38 (FIGURE 14) is secured to each of the plates 4 at the projection 10 to serve as a reinforcement. This is preferably No. 18 gauge Corten steel. A U-shaped plate 40 (FIGURE 13) is secured to each side of each plate 4 around the opening 22. The plates 40 are preferably made of No. 18 gauge stainless steel. A bent plate 42 (FIGURES 9 and 10) of general U-shaped construction and having flanges 44 extends between and is secured to the projections 10 along two adjacent sides of the mats with the flanges 44 adjacent the top and bottom of the mat as best seen in FIGURE 11. Six U-shaped reinforcing members 46 are secured in spaced apart relationship within each member 42 and an opening 48 is provided through the members 42 and 46 as shown in FIGURES 9 and 10. It will be seen that the members 42 and 46 provide a tongue 50 along one side of the mat and a tongue 52 along an adjacent side.

A generally U-shaped member 54 (FIGURES 7 and 8) having flanges 56 extends between and is secured to the plates 4 within the openings 22 along the other two sides of the mat as best shown in FIGURE 12. Six U-shaped reinforcing members 58 are secured to each member 54 in spaced apart relationship. The flanges 56 are cut away at 60 in line with a hole 61 in the members 54 and 58. The members 54 and 58 provide a groove 62 along a third side of the mat and a groove 63 along the adjacent fourth side. Flanged top cover sheet 64 and flanged bottom sheet 66 complete the mat. The flanges of the sheets 64 and 66 extend over the ends of members 42 and 54. Holes 67 are provided in sheet 64 in alignment with the holes 61. The mats are preferably made of Corten steel except the plates 40 which are preferably made of stainless steel.

In assembling the mats, the parts are preferably secured together by means of an adhesive such as that sold by Minnesota Mining and Manufacturing Company as No. EC-2214 or EC-2336. Another suitable epoxy adhesive is United States Steel Chemical AD5A20. After the plates 4 are assembled they are secured together by means of adhesive extending along the joints thereof. The members 38 and 40 are also secured to the sheets 4 by means of the adhesive after which the members 42 with the members 46 secured thereto by means of adhesive are attached to projecting ends of the plates 4, the flanges 12, 14, 16, 18 and 20 providing contact surfaces for the adhesive. The flanges 12, 14, 16, 18, 20, 24, 26, 28, 30 and 32 may be eliminated from plates 4 and flanges provided on plates 38 and 40 for attachment to plates 4. The members 54 with the members 58 secured thereto by adhesive are also secured to the opposite ends of the plates 4, the flanges 24, 26, 28, 30 and 32 providing contact surfaces for the adhesive. The plates 64 and 66 are then secured by means of the adhesive to the flanges 6 and 8 and to the members 42 and 54, this being by means of the adhesive.

In assembling the mats 2 as shown in FIGURES 1 and 5, the tongues 50 and 52 of one mat will extend into grooves 62 and 63 of adjacent mats with the holes 48, 61 and 67 in alignment. A pin 68 is passed through each set of aligned holes and will rest upon the bottom sheet 66. It is preferred that the mats will be arranged as shown in FIGURE 1 with the joints therebetween arranged at an angle A to the direction of travel of a wheel passing thereover. If desired the end mats 2A, 2B, 2C, 2D, 2E, 2F, 2G and 2H may have a portion cut off so as to provide a straight line at the end of the deck.

The parts so far described are those shown in my above identified co-pending application. According to the present invention I provide a plurality of concave depressions 70 in the top cover sheet 64. It will be seen that the depressions 70 have their tops generally co-extensive with opening 72 formed by the plates 4. Since the openings shown are square, the top of the openings 70 are also substantially square with rounded corners. If the openings 72 are other than square the top of the depressions 70 will also be other than square. Sides 74 of the depressions taper downwardly and inwardly to a relatively flat bottom 76. Since the thickness of the metal is not reduced to any great extent the bottom of the cover sheet 64 will extend below the top of the plates 4.

Prior to the introduction of the depressions 70, I found that the bond between the top cover sheet 64 and the plates 4 often was broken in various spots under heavy load conditions and I believe that this is what caused the strength to be less than that of my improved mat. I have found that my improved construction prevents fracturing of the bond between the cover sheet and plates. While increased strength is obtained even though the shape of the depression is varied from that shown, it is very much preferred to have the depressions of the shape described since the depressions provide a mean for aligning both the discontinuous and continuous flanges of the plates 4. This results in maximum strength and more ready and accurate assembly of the mat with the openings 72 being more uniform in size and shape. One shape of depression which may be used is circular with completely curved sides, such as a segment of a sphere.

While one embodiment of my invention has been shown and described it will be apparent that other adaptations and modifications may be made and that the mat may be used for other purposes without departing from the scope of the following claims.

I claim:

1. A mat comprising a plurality of metal plates, means connecting said metal plates to form a plurality of cellular openings, the top of said plates being in a common plane and the bottom of said plates being in a second common plane, said plates having horizontal flanges at

the top thereof, a metal top cover sheet having flat surfaces resting on said flanges with adhesive therebetween, said top cover sheet having a plurality of concave depressions therein with downwardly and inwardly tapering sides, each of said depressions being within one of said openings, the top of each depression being generally co-extensive with its associated opening, the bottom of said top cover sheet at said depressions extending below the top of said plates, and a metal bottom cover sheet secured to the bottom of said plates.

2. A mat according to claim 1 including a torque along one side of said mat, and a groove along the opposite side thereof.

3. A portable deck comprising a plurality of mats according to claim 2 assembled with the tongue of each mat extending into the groove of an adjacent mat and the groove of each mat receiving the tongue of an adjacent mat, and means holding the mats in assembled relationship.

4. A mat according to claim 1 in which said plates are arranged in two sets with the plates in each set being parallel to one another, and the plates of one set intersecting the plates of the other set at right angles so as to provide a plurality of rectangular openings between the plates.

5. A mat according to claim 4 including a projection at one end of said plates, said plates each having a cut out portion at their other end, said projections being aligned along two adjacent sides of said mat, said cut out portions being aligned along the other two sides of said mat, a steel plate extending between and over said aligned projections on each of said adjacent sides to form a tongue along each of said adjacent sides, and a steel plate extending between said aligned cut out portions on each of said other sides to form a groove along each of said other sides.

6. A portable deck comprising a plurality of mats according to claim 5 assembled with the tongues of each mat extending into grooves of adjacent mats and the grooves of each mat receiving the tongues of adjacent mats, and means holding the mats in assembled relationship.

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