June 29, 1943. R. J. BARRY 2,323,272

PANEL CONNECTION

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FIG. 1.

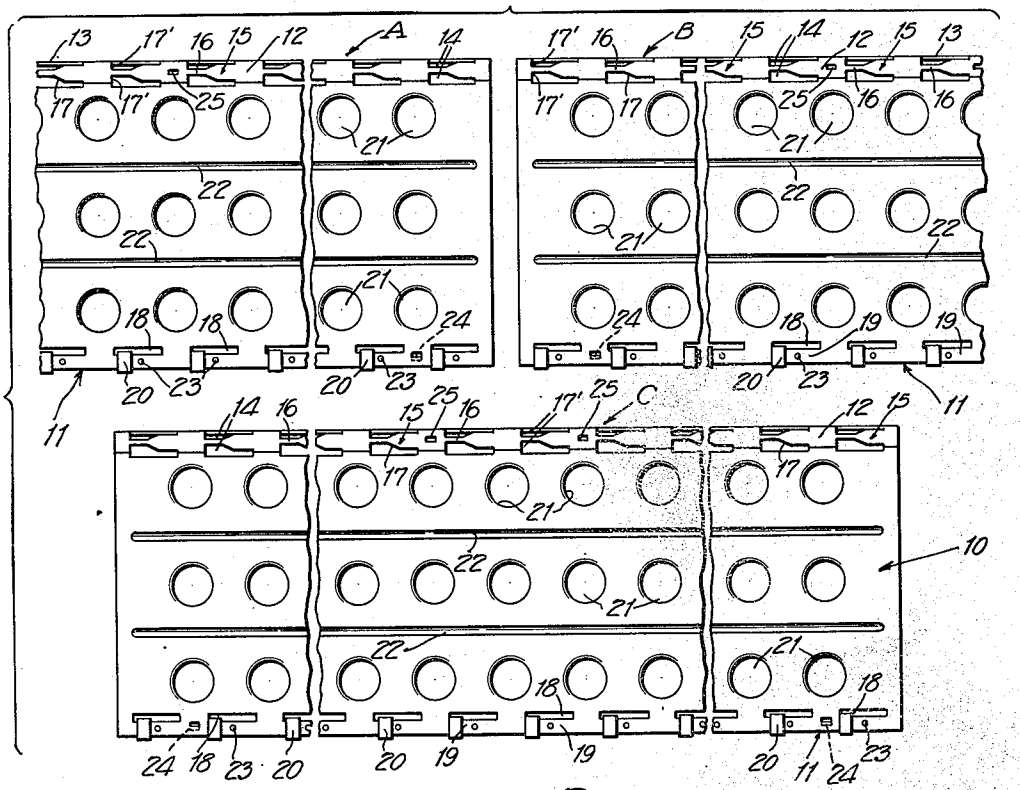
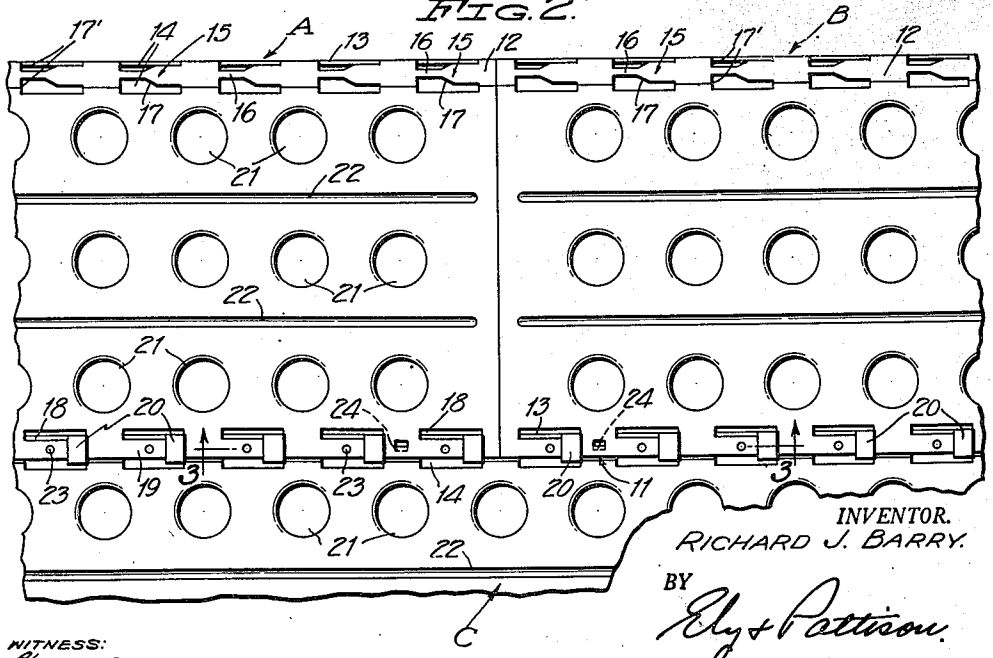


FIG. 2.



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FIG. 3.

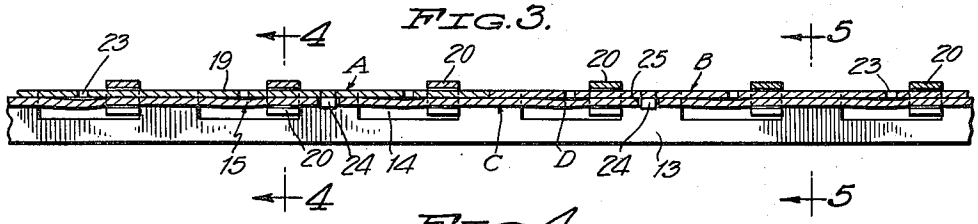


FIG. 4.

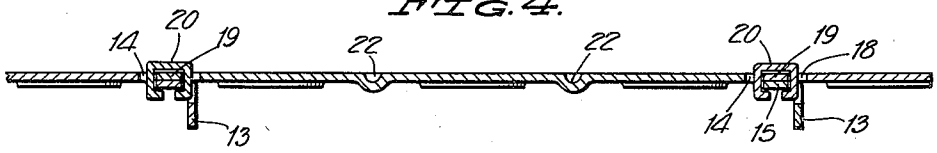


FIG. 5.

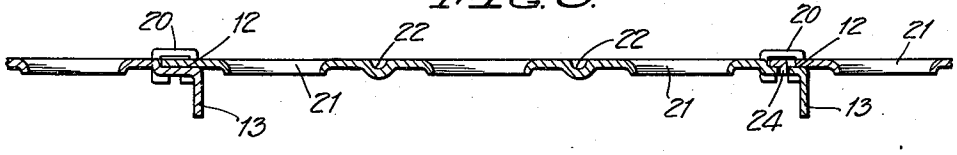


FIG. 6.

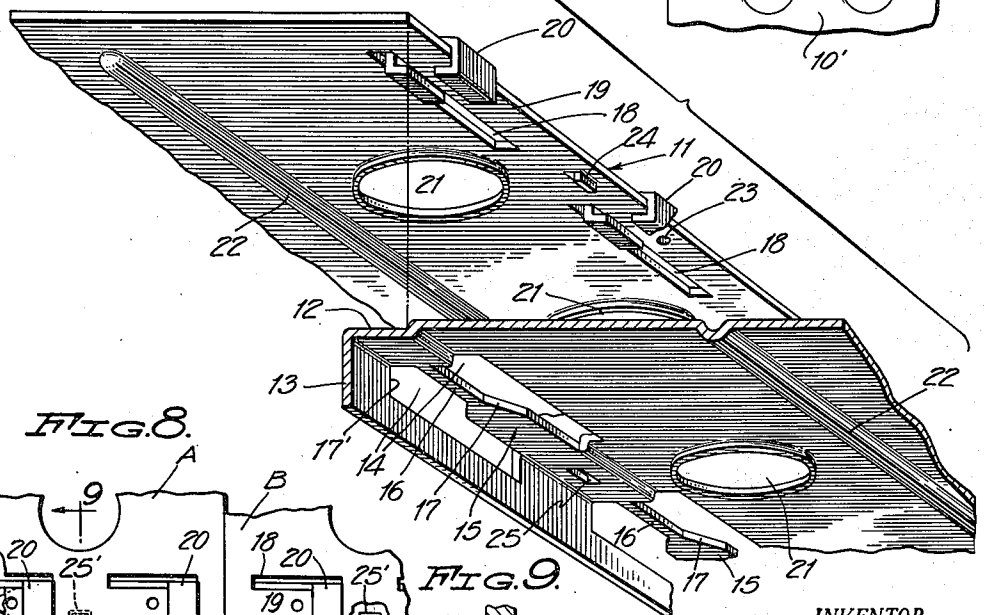


FIG. 7.

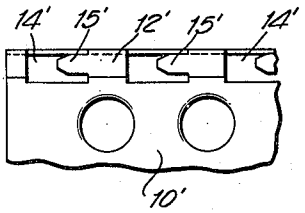
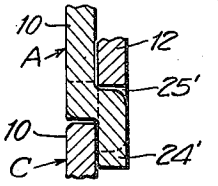


FIG. 8.

FIG. 9.



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UNITED STATES PATENT OFFICE

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PANEL CONNECTION

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Application November 20, 1942, Serial No. 466,346

10 Claims. (Cl. 94—13)

This invention relates to improvements in panel connections and has particular reference to coupling means for connecting adjacent metal plate panels together to form an emergency airfield landing mat.

Heretofore, steel plate landing mat panels have been coupled together by a fastening means embodying pointed hooks disposed along their outer edges. Such a coupling has not proven satisfactory, due in part, to the fact that the hooks become bent in transit and during handling, which makes it difficult to effect a quick coupling when the panels are laid side by side to form an emergency landing field for airplanes. Furthermore, the aforesaid coupling means embodying the pointed hooks are likely to cause body injury to persons handling the same and to cause tearing of the clothes of persons handling the panels. Also, the joints between adjacent plate panels are loose and the edges of the panels protrude above the traction surface, and it is difficult to remove a panel which might become damaged. Therefore, the primary object of this invention is to provide a coupling means for steel plate landing mat panels which eliminate sharp projections along the sides of the panels to prevent injury and tearing of the clothes of a wearer; to expedite the coupling of the mat panels in the field; to provide a tight rigid connection between the connected panels; and to permit the quick and easy removal of any damaged panels without disturbing or damaging any adjacent panel.

Another feature of the invention resides in a coupling means for plate panels which permit of the novel lapping of the joints between adjacent panels, with the upper exposed surfaces of the panels disposed in the same horizontal plane, whereby to provide smooth flush joints over which the wheels of a landing airplane may travel, and which tends to relieve the coupling means of any strains and stresses which might tend to cause loosening of the same.

A still further feature of the invention is to embody the coupling means set forth in my co-pending patent application for Grating, Serial No. 431,503, filed February 19, 1942, in an emergency airfield landing mat made of metal plate panels.

Additional features of the invention are to provide a metal plate panel and coupling means therefor which is relatively light in weight, easy to pack by stacking one upon the other; and simple and inexpensive of manufacture.

Other novel features of the invention will become apparent as the following specification is read in conjunction with the accompanying drawings, in which:

Figure 1 is a fragmentary top plan view of a plurality of metal plate panels about to be coupled together.

Figure 2 is an enlarged view similar to Figure 1 showing the several panels connected together.

Figure 3 is an enlarged detail vertical longitudinal sectional view on the line 3—3 of Figure 2.

Figure 4 is a vertical transverse sectional view on the line 4—4 of Figure 3.

Figure 5 is a view similar to Figure 4, but taken on the line 5—5 of Figure 3.

Figure 6 is a sectional elevational perspective view of the locking edges of two adjacent panels, said panels being in separated position and looking at the underside thereof.

Figure 7 is a fragmentary top plan view illustrating a modified form of coupling element.

Figure 8 is a fragmentary top plan view of a modified form of panel alining means, parts being broken away in section.

Figure 9 is an enlarged detail vertical transverse sectional view on the line 9—9 of Figure 8.

Referring to the drawings by reference characters, the letters A, B, and C, represent three separate panels constructed in accordance with the invention, and which are to be coupled together to provide a continuous airplane landing mat for emergency airfields, for flooring and armoring industrial floors, etc. Whereas the invention about to be described is adaptable for use as a portable horizontal landing field for aircraft, it is to be understood that panels for other purposes, such as partition structures and the like may be releasably joined together and the panels arranged in vertical position rather than in the horizontal position shown in the drawings.

Each of the mat panels comprises a rectangular rigid plate 10 and for use in the construction of a landing mat, the plate 10 is of steel of approximately one-eighth inch in thickness. The longitudinal edge 11 of the plate 10 is free, whereas the opposite longitudinal edge is downwardly offset to provide a shouldered seat 12 extending the full length of the plate. Integral with the offset edge is a depending flange 13, the same extending at right angle to the plane of the plate and which constitutes a supporting leg. In instances where the invention is used as for example, a vertical partition structure, the flange 13 may be dispensed with. Arranged at equidistantly spaced relation along the offset edge of the plate 10 are pairs of opposed slots 14, the

outermost of each slot 14 also extending into the flange 13 and which slots are formed prior to the forming of the offset 12 and bending of the flange 13. Each transversely opposed pair of slots 14 define a coupling element 15, the said element being disposed on the offset seat portion 12. The slots are of such shape to form a restricted portion 16 on the coupling element 15 and a tapered portion 17 extending from one end of the reduced portion 16, the other end of the reduced portion terminating in abutment shoulders 17'.

Arranged parallel to the free edge 11 of the plate 10 and disposed adjacent to said edge, is a row of elongated slots 18, the said slots being transversely alined with the coupling elements 15. The material between the slots 18 and the adjacent edge 11 constitutes web portions 19 and slidably connected with the web portions 19 are C-shaped metal coupling members 20. The open sides of the coupling members 20 face in the direction of the coupling elements 15 with which they are adapted to clampingly engage. The coupling members 20 are free to slide on the webs 19 for the length of the slots 18 and each coupling member 20 is of a cross sectional dimension to slidably embrace its supporting web 19 and the thickness of a coupling element 15.

In order to lighten the weight of the plate 10, the same is provided with three longitudinal rows of equi-distantly spaced transversely alined openings 21, said openings also permitting grass to grow therethrough when the panels are used as an emergency landing field to provide a camouflage therefor. In order to strengthen the plate 10, the same is formed between adjacent rows of openings 21 with downwardly punched ribs 22, the ends of which may terminate short of the ends of the plate 10.

Each panel has index lugs or tongues 24 bent from the plate 10 adjacent its ends and adjacent the edge 11. The offset edge 12 at spaced distances apart adjacent the mid portion of the length thereof has slots 25 therein. The legs 24 of one panel interfit with the slots 25 of an adjacent panel to effect an alinement of the coupling slide members 20 of one panel with the coupling elements 15 of an adjacent panel.

In practice, the panels A, B, and C in Fig. 1 are about to be coupled totgether, the panels A and B being arranged in end to end relation with the panel C lapping said ends and adapted to be coupled to the adjacent side edges of the panels A and B. With the adjacent ends of the panels A and B abutting, the edges 11 of said panels are lapped over the offset seat 12 of the panel C with the coupling slide members 20 being disposed adjacent one of the ends of the slots 18. The panels may be tilted on end to cause all the coupling members 20 to slide to their release position as shown in Figure 1. With the coupling slide members 20 in this position, the panels are initially connected by causing the lugs 24 of one panel to interfit with the slots 25 of an adjacent overlapping panel whereupon the open sides of the C-shaped coupling members respectively aline with the reduced portions 14 of coupling elements 15. An operator may now strike each coupling slide member 20 to slide it toward the tapered portion 17 to cause the same to ride over the tapered portion and onto the wide body portion of the element 15, at which time the C-shaped coupling member clamps the underside of the element 15 against the adjacent web 19. It will thus be understood that after each C-shaped coupling member 20 is driven home to its locking position, the overlapping edges of adjacent panels are rigidly secured together. If desired, a punch tool may be inserted through openings 23 provided in the web portions 19 and a blow imparted to the tool to deform or downwardly flex the reduced portion 16 of the coupling element 15 as shown at D in Figure 3. This deforming of the element 15 prevents accidental sliding of the coupling slide member 20 to a releasing position. When it is desired to disconnect adjacent panels, a blow may be imparted to the upper exposed edge portion of each coupling member 20 slide the same toward the releasing end of the slot 18.

The flanges 13 have been referred to as supporting feet for the purpose of supporting the plates above the plane of a supporting surface, but when in use as a landing mat for aircraft, the flanges 13 will become embedded in the ground and act as anchors against the force imparted to the panels during the landing of an aircraft on the landing mat. In practice, the plane is intended to land in a direction transverse to the length of the panels and by offsetting one of the edges of each panel to receive the thickness of the lapping edge of an adjacent panel, the smooth joint is provided between the panels. The upper surface of the panels forming a landing mat are on substantially the same plane which permits of easy riding of the landing wheels of an airplane over the landing mat.

While the lapping of the end edges of the panels A and B by the panel C on one side thereof and by a similar lapping and coupling panel along the other side of panels A and B, a tight coupling is effected between the panels, I wish it to be understood that the coupling elements 15 and 20 may be provided along the meeting end edges of the panels A and B if so desired.

In Figure 7 of the drawings is illustrated a modified form of coupling element 15' formed by means of the spaced slots 14' disposed along the offset flange 12' of a plate 10'. The coupling elements 15' are in the form of pointed tongues and are the equivalent to the coupling elements 15 aforementioned. By the use of the tongue coupling elements 15', the mouth openings of the C-shaped coupling elements 20 may be closed to provide a closed slide ring.

In Figures 8 and 9 I have illustrated a modified form of panel alining means which may be used in lieu of the tongues 24 and slots 25 aforementioned. In this form the offset flange 12 is provided with spaced slots 25' while the opposite edge 11 has suitably spaced apart offset tongues 24'. The tongues 24' and slots 25' of the overlapping edges of adjacent panels will effect an alinement of the coupling slide members 20 with the reduced portions 16 of the coupling elements 15, to expedite the coupling of the panels together. A slight tilting of one panel relative to the others is necessary to insert the offset tongues 24' into the slots 25', after which the panel may be swung to a plane with the panel or panels to which it is to be fixedly coupled.

While I have shown and described what I consider to be the most practical embodiments of my invention, I wish it to be understood that such changes in construction and design as come within the scope of the appended claims may be resorted to if desired without departing from the spirit of the invention.

Having thus described the invention, what I

claim as new and desire to secure by Letters Patent of the United States, is:

1. A panel comprising a rectangular shaped metal plate having an integral flange extending at right angle therefrom along one of the longitudinal edges thereof, said plate and flange having sets of transversely alined cut-away portions defining coupling elements, each of the coupling elements having a reduced tapered portion, the plate adjacent its other longitudinal side edges having slots therein defining with said edge, elongated web portions, and C-shaped coupling members slidably mounted on said web portions and having their open sides facing in the same direction as the flange, whereby the C-shaped coupling members may be brought into coupling relation with the coupling elements of a companion panel when two or more panels are to be fixedly connected together with their opposite longitudinal edges in overlapping relation.

2. A panel as set forth in claim 1 in which the longitudinal flange edge of the plate is offset in the direction in which the flange extends to provide a shouldered seat for the overlapping edge of a companion panel.

3. In combination, a pair of metal plates having straight complementary overlapping side edges, portions of the under edge of one plate being cut away to define a tapered coupling element extending in a direction parallel to said edge, the upper overlapping edge of the other plate being slotted to define an elongated web, and a ring-like coupling slide member slidably mounted on said web to receive the reduced portion of the same to enable the coupling slide member to be slid to a coupling position to clampingly embrace the wider portion of the tapered coupling element to rigidly secure the overlapping edges of the two panels together.

4. In a combination as set forth in claim 3, which is characterized by offsetting the underlapping edge of the one plate to provide a shouldered seat for the overlapping edge of the other plate.

5. In a combination as set forth in claim 3 in which the overlapping edges of the plates are provided with interfitting means to effect an alinement of the coupling slide members with the respective reduced portions of the coupling elements preparatory to the sliding of the coupling slide members to coupling position.

6. In a combination as set forth in claim 3 in which the overlapping edges of the plates are provided with interfitting tongues and slots to effect an initial coupling of the panels and to aline the coupling slide members with the respective reduced portions of the coupling elements preparatory to the sliding of the coupling slide members to coupling position.

7. A portable landing mat comprising in combination, a flat rigid panel, a companion panel having one of its edges overlapping an edge of the first mentioned panel, C-shaped coupling members slidably and captively mounted on the overlapping edge of the companion panel and having their open sides facing the adjacent edge portion of the first panel, the lapped edge of the first panel having pairs of spaced opposed slots, each pair of slots defining a coupling element with which a C-shaped coupling member may be slidably engaged for rigidly coupling the panels together.

8. A portable airplane landing mat comprising, in combination, panels having substantially flat face portions disposed in flat-wise overlapping relation, and interlocking means provided along overlapping edges of the face portions of the panels for rigidly coupling the same together, said interlocking means comprising a slide element captively mounted on one face portion for sliding movement in a direction substantially parallel to the plane of said face portion, said slide element engaging a tongue element on the other face portion.

9. A portable airplane landing mat comprising, in combination, panels having substantially flat face portions disposed in flat-wise overlapping relation, and interlocking means provided along overlapping edges of the face portions of the panels for rigidly coupling the same together, said interlocking means comprising a slide element captively mounted on one face portion for sliding movement in a direction substantially parallel to the plane of said face portion, said slide element engaging a tongue element on the other face portion, and interfitting means provided along the overlapping edges of the panels for alining the interlocking means preparatory to the actuation of the same to coupling position.

10. A portable airplane landing mat comprising, in combination, panels having substantially flat face portions disposed in flat-wise overlapping relation, and interlocking means provided along overlapping edges of the face portions of the panels for rigidly coupling the same together, said interlocking means comprising a slide element captively mounted on one face portion for sliding movement in a direction substantially parallel to the plane of said face portion, said slide element engaging a tongue element on the other face portion, and interfitting means provided along the overlapping edges of the panels for alining the interlocking means preparatory to the actuation of the same to coupling position, said interfitting means comprising spaced tongues provided on one of the panels, the other of the panels having spaced slots therein for respectively receiving said spaced tongues.

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