

[54] SCAFFOLD GUARD RAIL ASSEMBLY

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[51] Int. Cl. **E04g 5/00**

[58] Field of Search..... 182/113, 178, 179;
248/222; 256/65, 59

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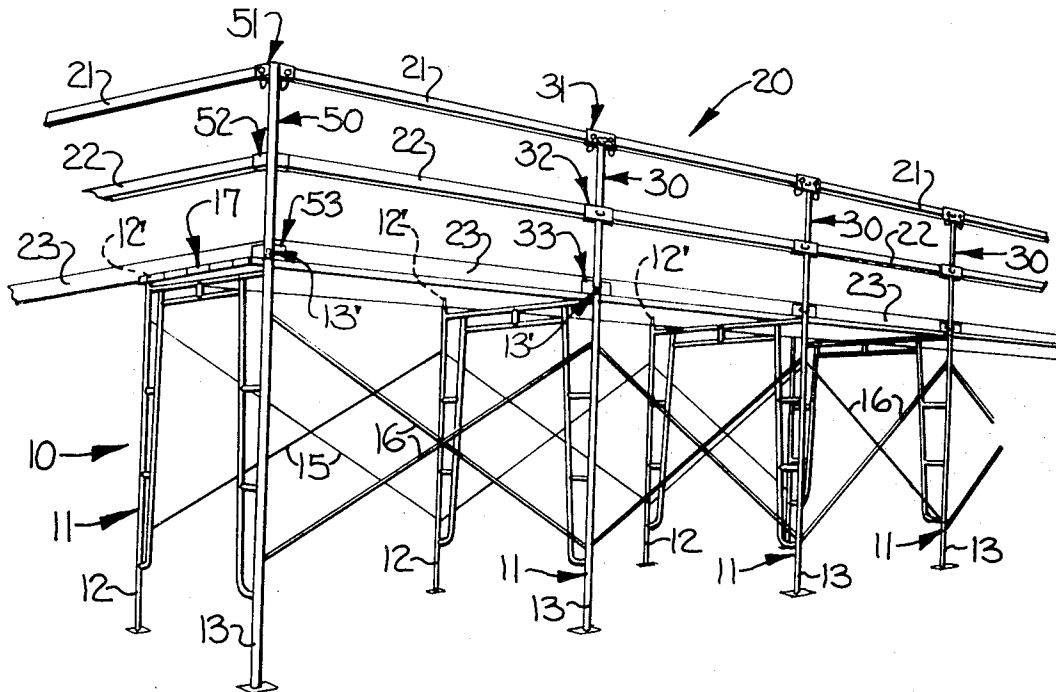
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[57]

ABSTRACT

A guard rail assembly mounted on a conventional scaffolding structure to be used primarily during the construction of a building to protect workers from falling from the scaffolding and to prevent construction materials from being kicked from the scaffolding. The guard rail assembly comprises a plurality of spaced tubular guard rail posts, having lower ends matingly receiving reduced upper end portions of outer legs of the scaffolding structure and being carried thereby. A plurality of guard rail brackets are affixed to each guard rail post in vertical spaced relation, a plurality of horizontal guard rails being supportingly carried by said guard rail bracket and interconnecting the guard rail posts to provide a protective railing along the outer side edge of the platform.

6 Claims, 8 Drawing Figures



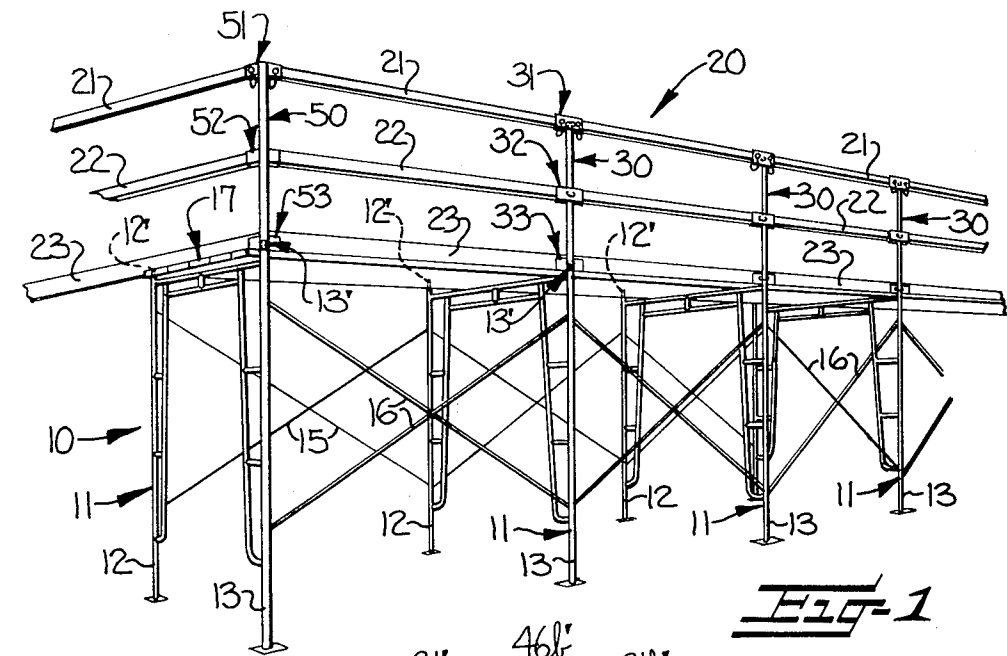


Fig-1

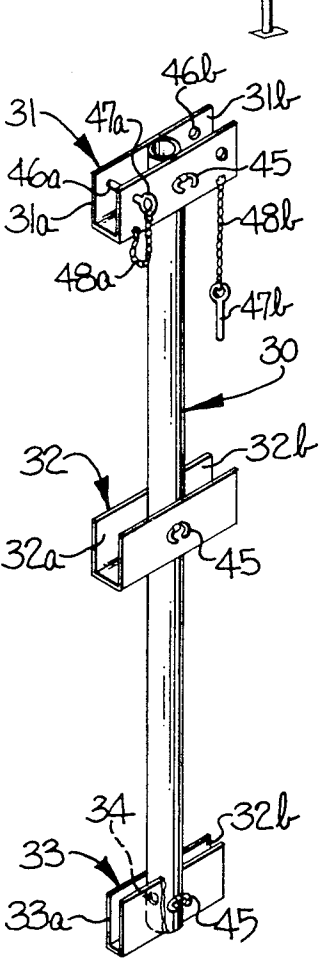


Fig-2

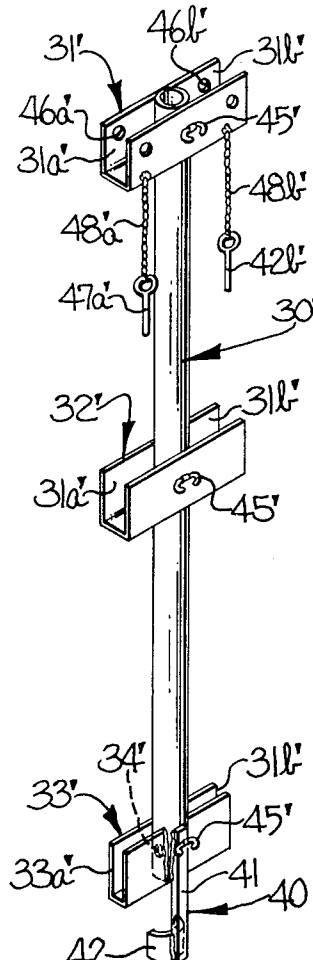


Fig-3

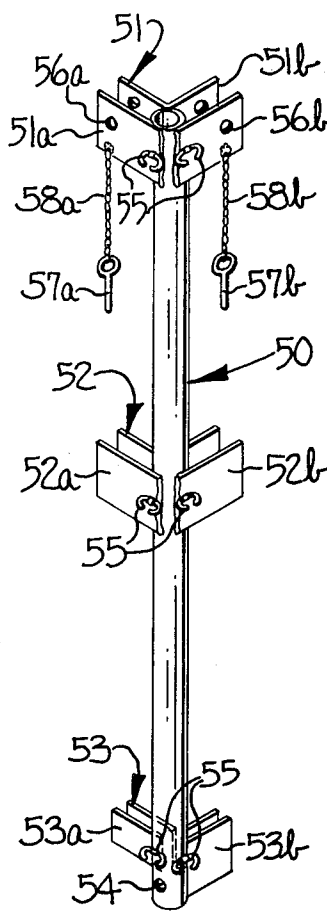


Fig-4

2 Sheets-Sheet 2

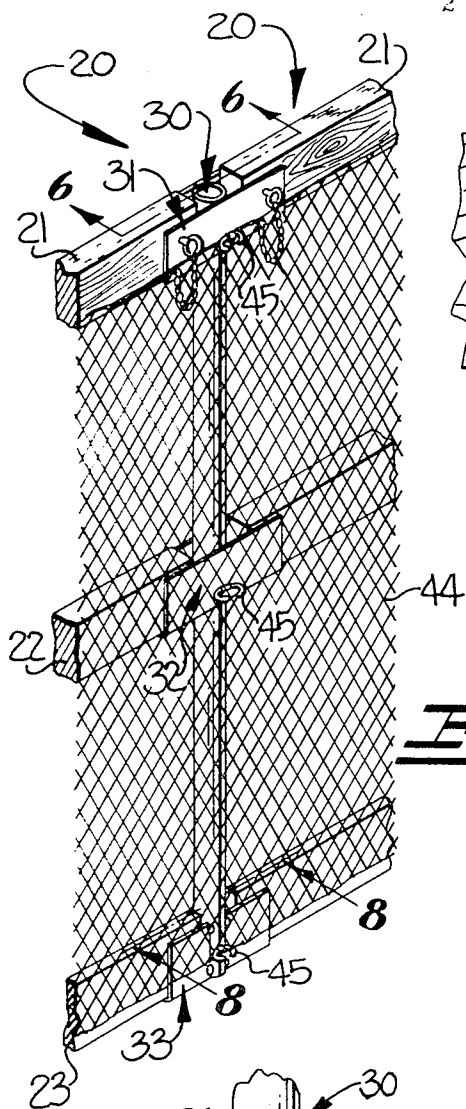


FIG-5

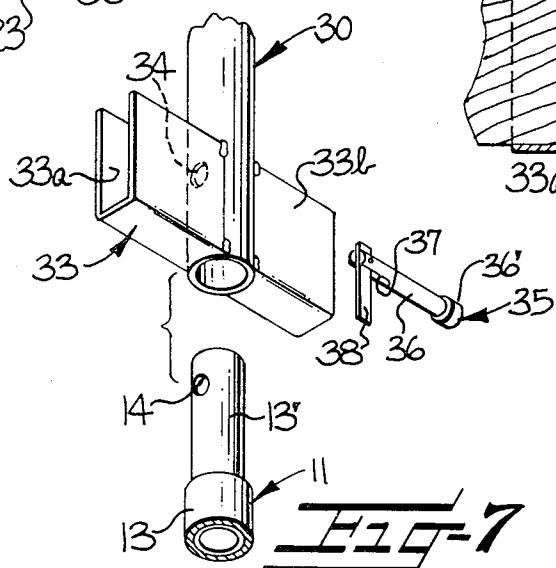


FIG-7

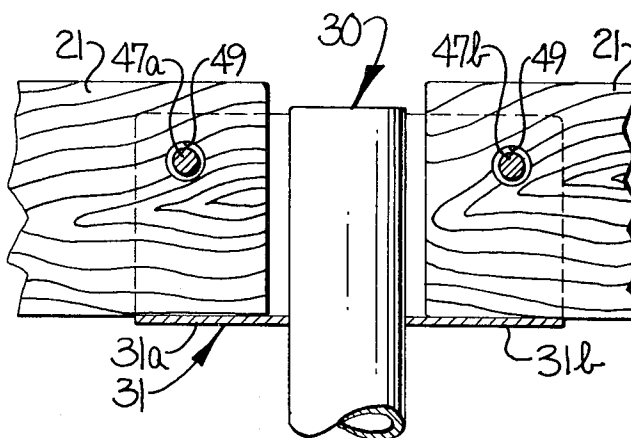


FIG-6

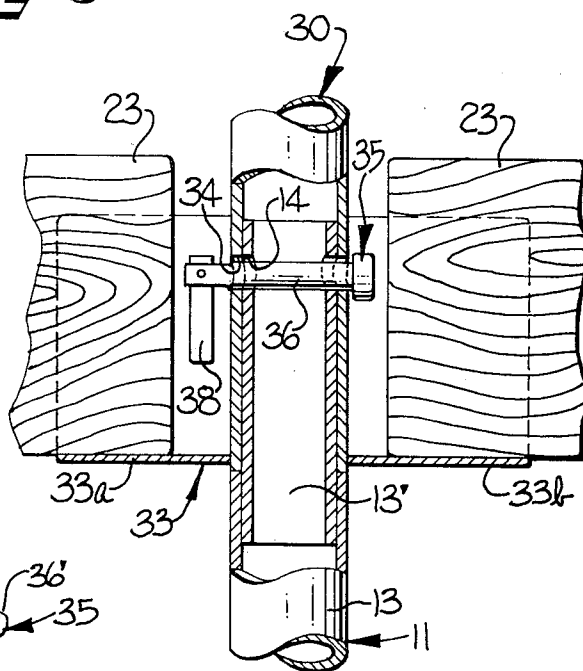


FIG-8

SCAFFOLD GUARD RAIL ASSEMBLY

This invention relates generally to a protective guard rail assembly adapted to be used with a conventional scaffolding structure, and being of improved design and safety. The invention is designed to be used primarily during building construction, more particularly to protect workers while engaged in work on the scaffold, and to prevent construction materials from being kicked off of the scaffolding on to passersby.

Scaffolding structures of various types are old in the art, as is the inclusion therewith of guard rail assemblies of various types. Most prior art structures, however, are either of such flimsy design that little real protection is offered to the workers, or the structure is so complicated that it is difficult to assemble and prohibitively expensive.

It is, therefore, an object of this invention to provide a guard rail assembly designed to be easily and quickly installed on a conventional building construction scaffold.

It is another object of this invention to provide a guard rail assembly which allows quick removal of a part thereof from the scaffolding structure when necessary to accommodate the loading or unloading of supplies or materials.

It is a further object of this invention to provide a guard rail assembly which can be quickly detached from the scaffolding structure and replaced at a higher level after additional scaffolding has been added.

Some of the objects of this invention having been stated, others will appear as the description proceeds when taken in connection with the accompanying drawings, in which:

FIG. 1 is a perspective view of a scaffolding structure with the guard rail assembly mounted thereon;

FIG. 2 is a perspective view of one embodiment of the guard rail post;

FIG. 3 is a perspective view of a second embodiment of the guard rail post;

FIG. 4 is a perspective view of a corner guard rail post;

FIG. 5 is a fragmentary perspective view of the guard rail assembly illustrated in FIG. 1, with screening material affixed to provide additional protection;

FIG. 6 is a vertical cross section taken substantially along line 6—6 of FIG. 5 showing the upper end of the guard rail post shown in FIG. 2, and guard rails supportingly carried thereby;

FIG. 7 is an exploded view showing the manner of securing the guard rail posts to the reduced upper end portion of the outer tubular legs of the scaffolding structure frame units, with parts broken away; and

FIG. 8 is a vertical cross section taken substantially along line 8—8 in FIG. 5, showing the lower end of the guard rail post of the embodiment in FIG. 2, and the reduced upper end portion of the outer tubular legs of the scaffolding structure frame unit as secured together.

With particular reference now to FIG. 1, there is illustrated a guard rail assembly 20 mounted on a scaffolding structure 10. A plurality of frame units 11, each having spaced inner and outer legs 12, 13, respectively, are laterally interconnected by criss-crossing sets of connecting rods 15 and 16 to form the scaffolding structure. As is indicated in FIG. 1, each of the inner and outer legs 12 and 13 have upper end portions of reduced size, indicated by reference numerals 12', 13', respectively, for aiding in stacking a plurality of inter-

connected frame units on top of each other. The reduced upper end portions also straddle platform 17 carried by the assembled frame units and prevent lateral shifting thereof off of the scaffolding.

Extending upwardly from the interconnected frame units and supported thereby is the guard rail assembly 20, comprised of a plurality of tubular guard rail posts 30, matingly received on the reduced upper end portions 13' of outer legs 13. Suitably affixed, as by welding, to each of the guard rail posts is a plurality of vertically spaced guard rail brackets, comprising an upper guard rail bracket, an intermediate guard rail bracket, and a lower guard rail bracket, broadly indicated by reference numerals 31, 32, and 33, respectively. Horizontal upper, intermediate and lower guard rails 21, 22, and 23, respectively, are supportingly carried in said guard rail brackets.

Defining the corner of the guard rail assembly 20 is a corner guard rail post 50 having affixed thereto a plurality of vertically spaced guard rail brackets comprising an upper guard rail bracket, an intermediate guard rail bracket, and a lower guard rail bracket, broadly indicated by reference numerals 51, 52, and 53, respectively, supportingly carrying ends of the respective guard rails 21, 22, and 23.

Referring now more specifically to FIG. 2, guard rail brackets 31, 32, and 33, each comprise opposing pairs of horizontally aligned upwardly opening U-shaped channel members extending outwardly from the opposite sides of the guard rail post 30, parallel to platform 17, forming upper, intermediate, and lower pairs of brackets 31a, 31b; 32a, 32b; and 33a, 33b; respectively.

With more particular reference to the upper and intermediate pairs of brackets 31a, 31b; 32a, 32b; respectively, as shown in FIG. 2, note that each pair is affixed to guard rail post 30 such that said post extends vertically through a hole of suitable size in the medial portion of each of said pairs of brackets, said guard rail post forming inner end walls of said pairs of brackets.

By way of contrast, note that according to the illustration in FIG. 2, the lower pair of brackets 33a, 33b, is narrower in internal widthwise dimension than either the upper or intermediate pair of brackets. Said pair of opposing brackets 33a, 33b, is formed by affixing upwardly opening U-shaped channel members to opposing sides of guard rail post 30 such that the cross-sectional width of the channel members is less than the cross-sectional size of the guard rail post. The purpose for this narrower pair of brackets is to suitably accommodate, as the guard rail 23, a wider board such as a conventional type of sub-flooring plank as would be ordinarily found on the typical building construction site, having dimensions of about one inch by six inches, while upper and intermediate pairs of brackets 31a, 31b, and 32a, 32b, are of such internal widthwise dimension as to suitably receive upper and intermediate guard rails 21, 22, comprising framing members having dimensions of about two inches by four inches. The greater height of the lower guard rail, by using wider planking, is intended to serve more effectively as a "toe board" to prevent construction materials and debris from being accidentally kicked off of the scaffolding by construction workers. This feature adds considerably to the safety of workers or passersby below the scaffolding.

In order to increase the stability of the guard rail assembly, means are provided in upper pair of brackets 31a, 31b to releasably secure the upper guard rails 21 in the upper pair of brackets. As is shown in FIGS. 2 and 6, upper pair of brackets 31a, 31b, has holes 46a, 46b extending laterally through their opposing walls. Upper guard rails 21 have transverse bores 49 adjacent their ends as shown in FIG. 6, such that when supportingly carried in the pair of upper brackets said bores are in alignment with holes 46a, 46b, in the brackets. Pins 47a, 47b, secured to pair of brackets 31a, 31b by a chain to prevent loss when not in use, extend through holes 47a, 47b, and bores 49, preventing accidental dislodgment.

Another embodiment of the guard rail post is shown in FIG. 3. Note that the embodiments as illustrated in FIGS. 2 and 3 are substantially identical except for a stabilizing member broadly indicated by reference numeral 40 in FIG. 3. Therefore, prime notation has been added to the reference numerals in FIG. 3 which identify identical elements of the invention.

As shown in FIG. 3, stabilizing member 40 is carried by and extends downwardly from the lower end of guard rail post 30'. Stabilizing member 40 comprises an elongate member 41, fixedly secured to the lower end of guard rail post 30', the lower end of said elongate member extending a predetermined distance below the lower end of said guard rail post. Carried by the lower end of said elongate member 41 is an inwardly facing arcuate member 42 partially encircling the outer tubular leg 13 of at least some of the scaffolding structure frame units 11, and enhancing the stability of the guard rail assembly by restricting the effect of forces directed outwardly against the guard rails and guard rail posts.

With particular reference now to FIG. 4, there is shown corner guard rail post 50 intended particularly to define the outer corner of the guard rail assembly 20. Affixed to corner guard rail post 50 is an upper guard rail bracket, an intermediate guard rail bracket, and a lower guard rail bracket, broadly indicated by reference numerals 51, 52, and 53, respectively. Each of the guard rail brackets comprise a pair of upwardly opening U-shaped brackets 51a, 51b; 52a, 52b; and 53a, 53b; respectively, each bracket of each of said pairs of brackets, affixed, as by welding, to guard rail post 50 at right angles to the other and supportingly receiving corner ends of upper, intermediate, and lower guard rails 21, 22, and 23, respectively.

With specific reference now to lower pair of brackets 53a, 53b, as shown in FIG. 4, note that bracket 53a is vertically offset upwardly relative to bracket 53b, thus allowing platform 17 to pass underneath bracket 53a without requiring vertical displacement of the entire guard rail post in the event that said platform happens to be longer than scaffolding structure 10.

As shown in FIG. 4, upper guard rail bracket 51 is provided with pairs of laterally aligned holes 56a, 56b in the upper pair of brackets 51a, 51b, respectively. These holes serve essentially the same function as do previously described holes 46a and 46b in the pair of upper brackets 31a, 31b.

As previously described, and as shown in FIG. 1, inner and outer legs 12 and 13 of frame units 11, have upper end portions of reduced size 12' and 13'. These reduced upper end portions ordinarily have a hole 14 extending transversely therethrough, such as shown in FIG. 7, to aid in securing a plurality of vertically

aligned frame units 11 together to form a higher scaffolding structure.

As shown in FIG. 7, the lower end of guard rail post 30 is adapted to be matingly received on the reduced upper end portion 13' of outer leg 13. When guard rail post 30 is so received, a transversely extending hole 34 provided in the lower end of guard rail post 30 is aligned therewith. Therefore, by positioning any suitable fastening means through the aligned holes, the entire guard rail assembly 20 can be connected to the scaffolding structure 10, thus preventing accidental dislodgment of the guard rail assembly.

Corner guard rail post 50, with a hole 54 extending transversely through the lower end portion thereof, as shown in FIG. 4, is likewise constructed so that when guard rail post 50 is matingly received over the reduced upper end portion 13' of outer corner leg 13, hole 54 in guard rail post 50, and hole 14 in reduced upper leg portion 13' are positioned in alignment, such that suitable fastening means may be positioned therethrough to secure guard rail post 50 to the scaffolding structure 10.

One such suitable fastening means for use on either guard rail post 30 or corner guard rail post 50 is broadly indicated by reference numeral 35, comprising an elongate member, or bolt 36, of suitable diameter to fit through aligned holes 34 and 14, with an enlarged head 36' on one end thereof. Extending inwardly a predetermined distance from the opposite end of elongate member 36, is a longitudinal slot 37. Pivotaly carried in said slot is an elongate latch 38, also of suitable size to extend through aligned holes 34 and 14. When elongate latch 38 is pivoted outwardly in alignment with elongate member 36, the latter can be extended through aligned holes 34 and 14 after which the elongate latch 38 is then pivoted to extend downwardly from elongate member 36 at an approximate right angle therefrom on the outside of the guard rail post. While elongate latch 38 is carried in such a manner, fastening means 35 is in latch position and cannot be withdrawn from aligned holes 34 and 14.

As described above, the guard rail assembly provides a simple, easy-to-assemble, but nevertheless sturdy unit which provides a high degree of protection to workers. An optional feature which adds to the safety provided by the guard rail assembly is shown in FIG. 5, wherein as shown therein, screening material 44 of any suitable type may be affixed to the guard rail assembly by means of fastening clips 45, carried by the guard rail post, to prevent construction materials from falling off of the platform 17. Similarly, in FIG. 4 there is shown fastening clips 55, by which screening wire can be attached to corner guard rail post 50.

It will be understood that various details of the invention may be changed without departing from the scope of the invention. Furthermore, the foregoing description is for purposes of illustration only, and not for purposes of limitation--the invention being described by the claims.

What is claimed is:

1. In a scaffolding structure formed of a plurality of interconnected frame units and horizontally arranged floorboards defining a platform carried by the frame units, each of the frame units being upright and having spaced inner and outer tubular legs with the upper ends of the legs being of reduced size for aiding in matingly stacking and securing the frame units in vertical align-

ment for obtaining the desired height scaffolding structure and with each of the upper ends of the legs having a hole extending transversely therethrough, the combination therewith of a protective guard rail assembly comprising:

- a plurality of spaced tubular guard rail posts having their lower ends matingly receiving the reduced upper end portions of said outer legs and being supported thereby, each of said guard rail posts having a hole extending transversely through the lower end thereof in alignment with a corresponding hole extending through the reduced upper end portion of a corresponding one of said legs,
- post fastening means extending through said aligned holes for releasably interconnecting said legs and guard rail posts and for securing said guard rail posts against rotation relative to said frame units and floorboards,
- a plurality of guard rail brackets affixed to said guard rail posts in vertically spaced relation and including for each guard rail post at least one toeboard bracket aligned with corresponding ones of said aligned holes and enclosing a corresponding one of said post fastening means and at least one upper rail bracket adjacent the upper terminal end of the corresponding guard rail post,
- each of said brackets comprising an upwardly opening U-shaped channel member extending horizontally outwardly from a side of said corresponding guard rail post with said toeboard brackets having lower portions substantially flush with the lower end of the respective guard rail post,
- a plurality of horizontal guard rails supportingly carried by said guard rail brackets and interconnecting the guard rail posts to provide protective railings along the outer sides of the platform, certain of said horizontal guard rails being received in said toeboard brackets and cooperating therewith in enclosing said post fastening means, and
- rail fastening means for penetrating said upper rail brackets and those ones of said horizontal guard rails which are supportingly carried by said upper rail brackets for releasably securing said pene-

trated rails against accidental dislodgement.

- 2. In a scaffolding structure according to claim 1, wherein at least one of said guard rail posts defines a corner of the scaffolding and wherein each of said vertically spaced guard rail brackets affixed to said one guard rail post comprise a pair of U-shaped channel members arranged at right angles to each other for supportingly receiving corresponding ends of corner guard rails therein.
- 3. In a scaffolding structure according to claim 2, wherein said one guard rail post defining a corner of the scaffolding has upper, lower and intermediate guard rail brackets and wherein said pair of U-shaped channel members forming said lower bracket are vertically offset relative to each other to permit the ends of the floorboards of the platform to extend outwardly beyond the scaffolding underneath the uppermost of said pair of vertically offset U-shaped channel members.
- 4. In a scaffolding structure according to claim 1, wherein a stabilizing member is carried by and extends downwardly from the lower end of at least certain guard rail posts to a predetermined distance below said guard rail posts, said stabilizing member engaging the outer tubular leg adjacent thereto thereby enhancing the stability of the protective guard rail assembly.
- 5. In a scaffolding structure according to claim 1, wherein a stabilizing member is carried by and extends downwardly from the lower end of at least certain guard rail posts to a predetermined distance below said guard rail posts, each of said stabilizing members comprising an elongate member fixedly secured to the lower end of said certain guard rail posts and extending downwardly therefrom, and an inwardly facing arcuate member carried by the lower end of said elongate member, and partially encircling the outer tubular leg adjacent thereto to thereby enhance the stability of said protective guard rail assembly.
- 6. In a scaffolding structure according to claim 1, wherein vertically spaced fastening means are carried by said guard rail posts and adapted for securing screening material thereto.

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