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Dagiel et al.

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[54] **REMOVABLE GUARD RAIL ASSEMBLY AND STANCHION BRACKET THEREFOR**

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[52] **U.S. Cl.** ..... **256/59**, 248/226 A, 256/65

[51] **Int. Cl.** **E04h 17/14**

[58] **Field of Search** ..... 256/59, 65, 1; 182/113; 248/226 A, 226 B

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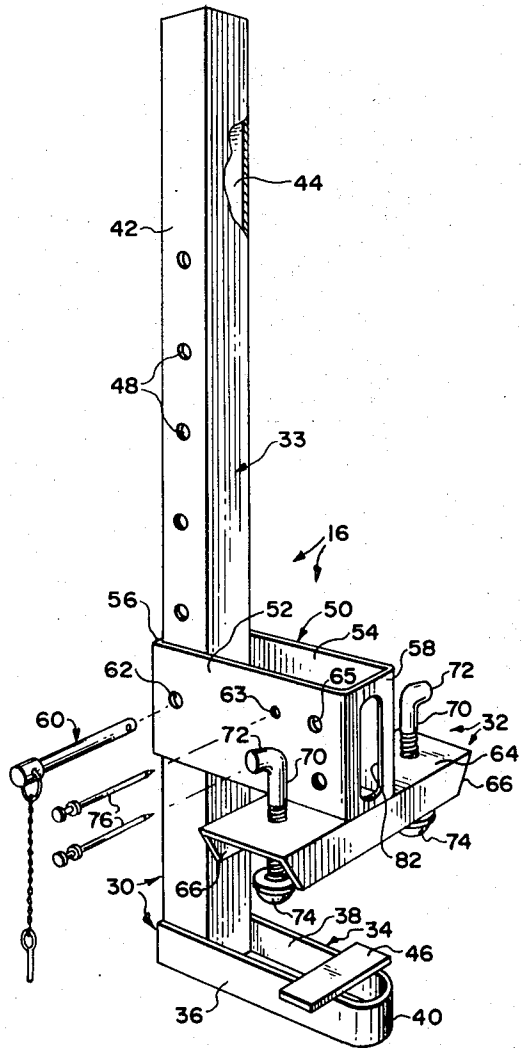
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[57] **ABSTRACT**

A guard rail assembly including a stanchion bracket which is designed for removable attachment to the outer edge of a concrete floor slab and, in combination with similar stanchion brackets, serves to support a series of upright stanchions which, in turn, are designed to support a wooden safety guard rail. In one form of the invention, the supported stanchion is in the form of a length of cut lumber to which the guard rail is nailed. In a modified form of the invention, the supported stanchion comprises a metal post. In both forms of the invention, provision is made for supporting a so-called kick board at foot level.

7 Claims, 5 Drawing Figures



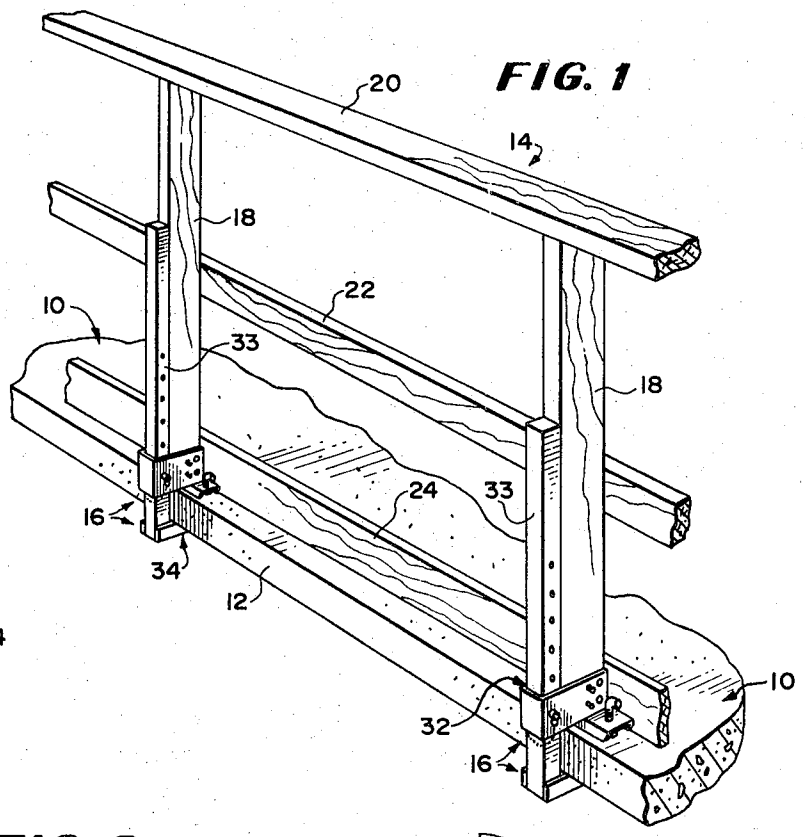


FIG. 1

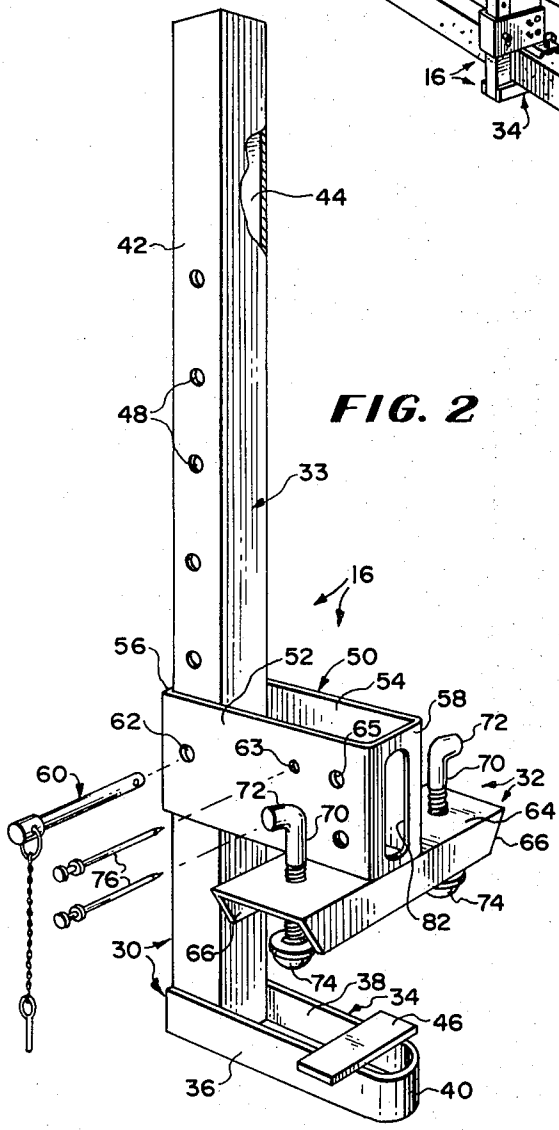


FIG. 2

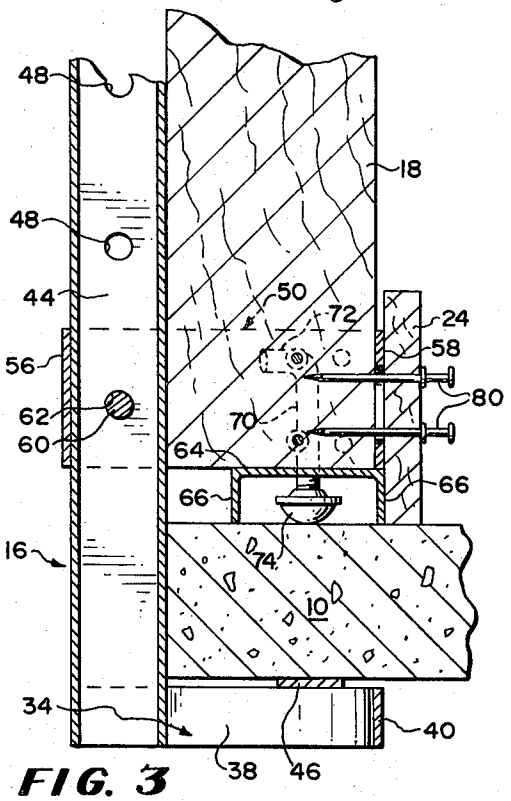


FIG. 3

FIG. 4

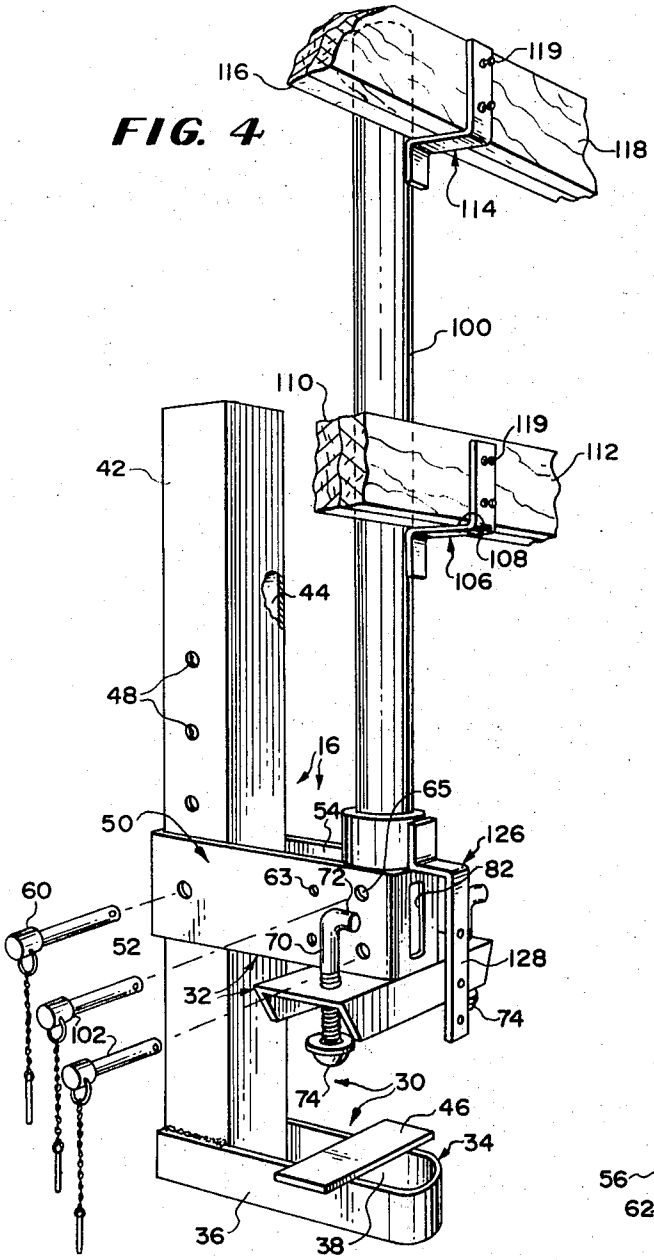
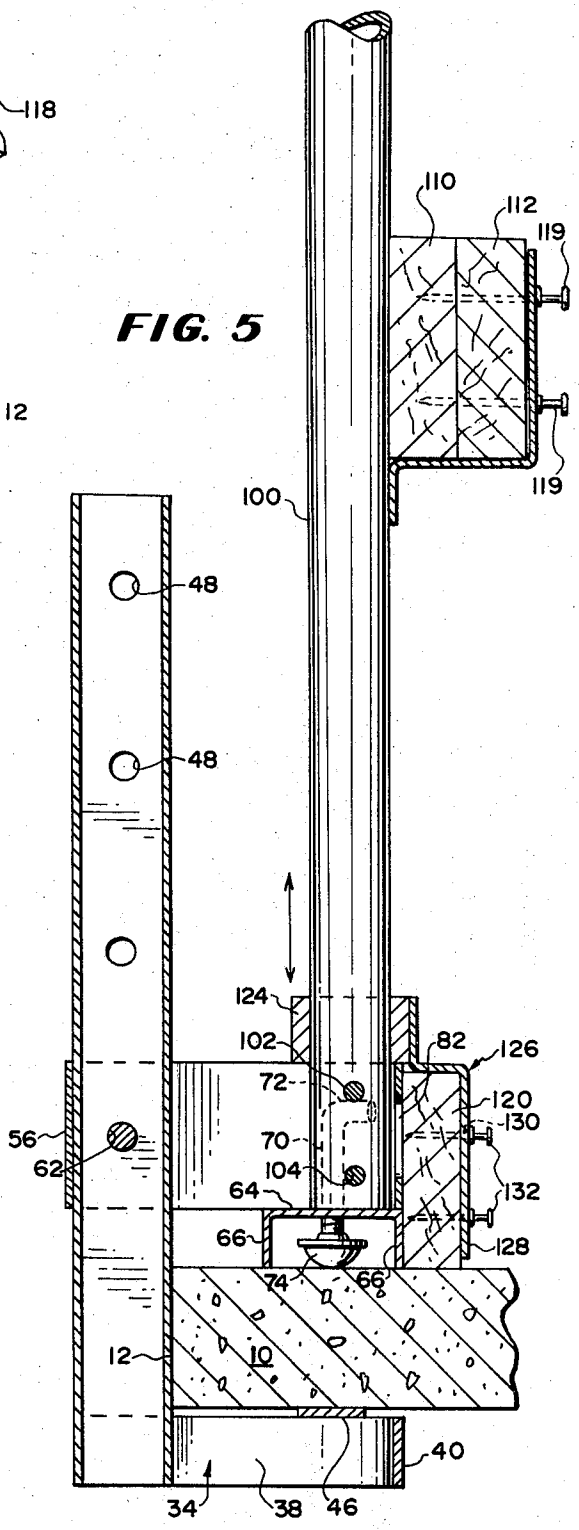

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114
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74
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FIG. 5


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REMOVABLE GUARD RAIL ASSEMBLY AND STANCHION BRACKET THEREFOR

The improved guard rail assembly and associated stanchion bracket comprising the present invention have been designed for use primarily in connection with the provision of a safety guard rail along the outer drop-off edge of a concrete floor slab which defines an upper story level of a building while it is under construction, the principal purpose being to protect the workmen on the floor slab from falls. The invention is, however, capable of other uses and a stanchion bracket embodying the principles of the invention may, if desired and with or without modification as required, be employed for guard rail supporting purposes in a wide variety of other situations or environments as, for example, in the provision of a temporary safety railing around the perimeter of a roof structure during painting or shingling operations, along the sides of a bridge construction until such time as the permanent guard railings are installed, or along a drop-off edge wherever it may occur. Regardless, however, of the particular use to which the invention may be put the essential features thereof are at all times preserved.

Due to current building expansion, particularly in metropolitan areas where there are currently being erected many high-rise apartments and tall office buildings, recent amendments to the federal Official Health and Safety Act have dictated that so-called perimeter posts and guard railings shall be placed along the drop-off edges of the concrete floor slabs which are associated with upper story levels of such buildings. This has resulted in the erection of make-shift guard railings consisting largely of lengths of lumber stock such as boards of the 2 inches × 4 inches variety, commonly referred to as "two-by-fours." Such boards are cut to length and then nailed together in varying patterns in order to afford the desired guard railings. After such railings have served their purpose they are knocked down, the longer boards being reserved for future use in the piecing together of future guard railings. The shorter boards are not always reusable. Furthermore, even the longer lengths of lumber frequently become damaged by splitting or otherwise due to the application thereto of repeated impact blows and different nail placements. Many such railings fail to pass the rigid requirements of safety inspectors. Still further, the erection of individual guard railings on the basis of cutting and fitting of the pieces or lengths of lumber requires the stocking of a large quantity of loose lumber, as well as the transportation of lumber pieces or boards from floor to floor as the building progresses in connection with erection thereof. Lack of a suitable concrete anchor for the thus erected wooden guard railings also presents a problem.

The present invention is designed to overcome the above-noted limitations that are attendant upon the construction and use of present-day temporary guard railings and, toward this end, the invention contemplates the provision of a novel guard rail stanchion bracket which is formed entirely of metal, is capable of ease of attachment to and removal from the free or outer edge of a concrete floor slab or the like, and when in position on such edge, affords a rigid support for a reusable stanchion in the form of a pre-cut length of lumber, such as a two-by-four board, to which the horizontal guard rail or rails proper may be suitably affixed as by nailing or the like. The novel or improved stanchion bracket, when applied to the free or drop-off edge of the floor slab, not only maintains the subsequently-to-be-applied wooden stanchion board in a vertical position but also reinforces such board throughout an appreciable portion of its height against leaning in any direction. Still further, according to the present invention, the metal stanchion bracket, although being applied to the vertical stanchion board immediately above slab level, does not interfere with the nailing of a kick board thereto.

In a modified form of the invention, the stanchion bracket per se, without any modification whatsoever, serves to support a metal stanchion post having facilities thereon for removably supporting a wooden guard rail and also having facilities whereby it may, removably or fixedly as desired, support a kick board.

The provision of a removable guard rail assembly of a stanchion bracket which is simple in its construction and, therefore, may be manufactured at a low cost; one which is comprised of commercially available structural components consisting mainly of flat metal and tube stock welded together, thus further contributing to economy of manufacture; one which requires neither special skills nor tools for its erection and dismantling; one which is readily adaptable to concrete floor or other slabs of varying thicknesses; one which is rugged and durable and, therefore, will withstand rough usage; one which meets present federal building code safety requirements; and one which otherwise is well adapted to perform the services required of it, are further desirable features which have been borne in mind in the production and development of the present invention.

Other objects and advantages of the invention not at this time enumerated will readily suggest themselves as the nature of the invention is better understood from a consideration of the following detailed description.

The invention consists in the several novel features which are hereinafter set forth and are more particularly defined by the claims at the conclusion hereof.

In the accompanying two sheets of drawings forming a part of this specification, two illustrative embodiments of the invention are shown.

In these drawings:

FIG. 1 is a fragmentary outside or front perspective view of a guard rail assembly embodying a plurality of the stanchion brackets embodying the present invention;

FIG. 2 is an enlarged inside or rear perspective view of one of the stanchion brackets;

FIG. 3 is an enlarged vertical sectional view of the stanchion bracket of FIG. 2;

FIG. 4 is a perspective view similar to FIG. 2 but showing the stanchion bracket associated with a metal stanchion post assembly; and

FIG. 5 is a vertical sectional view of the stanchion bracket of FIG. 4, such bracket being shown operatively applied to a concrete floor slab and in its operative guard rail-supporting position.

Referring now to the drawings in detail and in particular to FIG. 1, a platform structure in the form of a concrete floor slab **10** is illustrated. This slab may be considered for descriptive purposes herein to represent one of the upper story floor slabs of a building which is undergoing erection and with which the present guard rail assembly is to be used as a precautionary

safety measure for preventing either personnel from falling over the drop-off edge 12 of such slab or objects from rolling, sliding or otherwise passing over such drop-off edge. The guard rail assembly is designated in its entirety by the reference numeral 14 and, in general, it comprises a plurality of the novel stanchion brackets 16 embodying the present invention, a corresponding number of vertical stanchion posts 18, a horizontal upper railing 20, a horizontal lower guard rail 22, and a kick board 24. As shown in FIG. 1, the kick board extends along the edge region of the concrete floor slab 10 a slight distance inwardly of the drop-off edge 12 thereof. The guard rail assembly 14 is comprised largely of lumber in the form of two-by-fours, the various stanchion posts 18 being pre-cut to a predetermined length and the lower guard rail 22 and the upper railing 20 being sawed to required lengths at the scene of installation in accordance with the spacing between adjacent vertical stanchion posts 18. The stanchion brackets 16 are each of two-part metal construction except for the provision of certain clamping and other fastening devices the nature of which will become clear presently.

The various stanchion brackets 16 are identical in construction and, therefore, a description of one will suffice for all. Each bracket is comprised of two separable parts which, for descriptive purposes herein, will be referred to hereinafter as a pedestal part 30 and a socket part 32. The pedestal part 30 is in the form of a vertical tube or pedestal proper 33 which is square in transverse cross section and the lower end of which carries a laterally projecting jaw-forming foot 34 in the form of a strip of flat metal stock bent to U-shape configuration so as to provide a pair of parallel side legs 36 and 38 and a connecting arcuate bight portion 40. The inside faces of the distal end regions of the side legs 36 and 38 of the foot 34 are welded in face-to-face relationship to the lower ends of one pair of opposite sides 42 and 44 of the pedestal proper 33. Extending transversely across and welded to the upper edges of the proximal end regions of the side legs 36 and 38 of the jaw-forming foot 34 is a flat lower jaw plate 46 which is designed for clamping engagement with the underneath side of the edge region of the concrete floor slab 10 when the pedestal part 30 of the bracket 16 is operatively installed upon the slab in a manner that will be made clear presently. The ends of the jaw plate 46 overhang the side legs 36 and 38 of the jaw-forming foot 34. Plural pairs of opposed pin-receiving holes 48 are provided in the sides 42 and 44 of the pedestal proper 33 by means of which the aforementioned socket part 32 may be secured to the pedestal part 30 at selected elevations along the pedestal proper 33.

The socket part 32 of the bracket 16 is in the form of a closed loop 50 of flat metal stock and of rectangular configuration, the loop including relatively long sides 52 and 54 and relatively short front and rear ends 56 and 58. The outer end portion of the loop 50 encompasses the pedestal proper 33 and is adapted to be secured thereto at selected elevations by means of a normally horizontal fast pin 60 which is adapted to be projected through aligned holes 62 in the front ends of the loop sides 52 and 54 and also the adjacent or aligned pair of holes 48 in the pedestal proper 33. Nail holes 63 are provided in the loop sides 52 and 54 near the intermediate portions thereof. Still other holes 65 of a somewhat larger diameter are formed in the sides 52 and 54 slightly rearwards of the nail holes 65 and serve a function that will be made clear when the nature of the modified form of stanchion bracket is set forth.

The disposition of the aligned openings 62 in the front ends of the loop sides 52 and 54 is such that when these openings register with a selected pair of holes 48 in the sides 42 and 44 of the pedestal proper 33, the latter is encompassed on three sides thereof and in face-to-face relationship by the rear end 56 and front end regions of the sides 52 and 54 of the loop 50 with substantially no tolerance being allowed so that the socket part 32 is rigidly held in position on the pedestal proper 33 of the pedestal part 30 of the bracket 16.

Extending transversely across and welded to the lower edges of the rear end regions of the sides 52 and 54 of the loop 50 is an upper jaw plate 64 the ends of which overhang said loop sides. Said upper jaw plate is provided with downturned reinforcing side edge flanges 66. Threadedly received through holes in the upper jaw plate 64 on opposite sides of the loop 50 are two vertically extending clamping screws 70 having laterally turned upper ends 72 and swivel feet 74, said swivel feet being designed for engagement with the upper surface of the concrete slab 10 when the stanchion bracket 16 is applied to the latter.

When it is desired to apply the stanchion bracket 16 to the drop-off edge 12 of the slab 10, it is applied in the manner of a conventional C-clamp, the jaw-forming foot 34 of the pedestal part 30 being positioned beneath the slab as shown in FIG. 3 with the pedestal proper 33 extending vertically upwardly alongside the edge 12 and with the socket part 32 of the bracket overlying the upper face of the slab. Prior to installation of the stanchion bracket 16 to the slab, the operator will adjust the position of the socket part 32 on the pedestal proper 33 so that the former part will overlie the slab after positioning the jaw-forming foot 34 beneath the slab at a distance sufficiently close to the slab that the effective range of the clamping screws 70 is such that these screws may be tightened against the slab, thus elevating the side edge flanges 66 of the upper jaw plate 64 slightly above the slab. The clamping action is thus effective between the lower jaw plate 46 and the swivel feet 74 of the clamping screws 70 with the result that the stanchion bracket 16 as a whole is securely clamped to the edge portion of the slab 10.

In erecting the guard rail assembly 14, after all of the stanchion brackets 16 have been secured in position over the drop-off edge 12 of the concrete floor slab 10, a stanchion post 18 which as previously stated is in the form of a two-by-four board cut to a predetermined length, is inserted endwise into each loop 50 so that its lower end is caused to rest upon the upper face of the upper jaw plate 64. It will be understood that in the manufacture of each stanchion bracket 16, close dimensional tolerances are maintained wherein the socket which is defined by the loop 50, the pedestal proper 33, and the jaw plate 64, maintains horizontal transverse and longitudinal dimensions of precisely 2 inches and 4 inches respectively so that the lower end of the wooden stanchion post 18 fits snugly in such socket when the lower end of the post engages the jaw plate 64. With each stanchion post thus supported in its respective socket, the post will be constrained to lie flush against the inner side of the associated pedestal proper 33 in coextensive face-to-face relationship rela-

tive thereto. If desired, dual-headed nails **76** may be driven through the holes **63** to retain the stanchion posts **18** in position within their socket-forming loops **50.**

After the various stanchion posts **18** have thus been installed on the brackets **16,** the remaining wooden components of the guard rail assembly **14** including the lower guard rail **22** and the upper railing **20** may be nailed in position on the stanchion posts **18** in the usual manner of wooden guard rail erection, the lower rail **22** being nailed to the upper ends of the posts in overlying bridging relationship.

Application of the kick board **24** of the guard rail assembly **14** is effected either before or after the wooden components **20** and **22** have been nailed in position. The application is made by positioning the kick board in edge-to-face relationship on the slab **10** as shown in FIG. **3** and against the various loops **50,** after which dual-headed nails **80** are driven through the kick board **24** and through elongated vertically extending clearance slots **82** which are formed in the rear ends **58** of the loops **50,** the nail shanks penetrating the rear side portions of the loop-encircled low ends of the stanchion posts **18,** thus clamping the kick board **24** hard against the loops **50** of the socket parts **32** of the stanchion brackets **16.**

Under certain circumstances, particularly if the guard rail assembly is relatively short, gang shifting of the entire guard rail assembly from one story level to another may be resorted to, utilizing a suitable hoist for the purpose. In such an instance, it is merely necessary to unfasten the various stanchion brackets **16** from the slab **10** by loosening the clamping screws **70** and slipping or shifting the entire guard rail assembly outwards from the slab. Otherwise, the various dual-headed nails which are used for fastening the wooden parts or components of the guard rail assembly in position may be withdrawn and the assembly thus dismantled for subsequent assembly at a different slab location and height.

In FIGS. **4** and **5** of the drawings, a slightly modified form of guard rail assembly is disclosed. In this form of the invention, the stanchion brackets **16** remain precisely the same as the stanchion brackets **16** previously described in connection with the form of guard rail assembly which is shown in FIGS. **1** to **3,** inclusive, and as a consequence and in order to avoid needless repetition of description, identical reference numerals have been applied to the corresponding parts as between the disclosures of FIGS. **2** and **4.** In the modified form of the invention, a saving in lumber costs may be effected by utilizing with each stanchion bracket **16** a tubular metal stanchion post **100** in place of the wooden stanchion post **18.** Such metal stanchion post **100** does not completely fill the socket which is afforded by the loop **50** and its associated upper jaw plate **64.** Instead, the lower end of said post **100** thereof projects into the inner region of the loop, rests on the jaw plate **64,** and is secured in position by fast pins **102** which are projected through the holes **65** in the loop sides **52** and **54,** as well as through aligned holes **104** (see FIG. **5**) in the lower end region of the stanchion post **100.**

The various stanchion posts **100** of the guard rail assembly of FIGS. **4** and **5** of the drawings are designed for use in connection with an intermediate wooden side rail and an upper wooden top railing. Accordingly, a lower Z-shaped bracket **106** is affixed by welding to a medial region of each stanchion post **100** and affords a horizontal ledge surface **108** of sufficient width as to accommodate the overlapping end regions of two adjacent two-by-four boards **110** and **112,** the latter constituting component parts of the side rail. A similar upper Z-shaped bracket **114** is welded to each stanchion post **100** adjacent the upper end thereof and affords a support for similar overlapping two-by-four boards **116** and **118** which constitute component parts of the upper guard railing. Dual-head nails **119** pass through holes **121** in the brackets **106** and **114** and serve fixedly to secure the boards in position.

In order to accommodate a kick board such as the board **120** of FIG. **5,** a collar or ring **124** is slidably received over each stanchion post **100** and is provided with a Z-shaped kick board retainer bracket **126,** the latter being welded to the periphery of the collar and having a downwardly extending offset retaining flange **128** which is provided with nail holes **130** therein. In connection with installation, the kick board **122** is positioned against the rear ends **58** of the various loops **50** of the socket parts **52** of the stanchion brackets, after which the collars **124** and their associated retaining flanges **128** are lowered along their respective stanchion posts **100** so as to capture the kick board **122** and thus retain it in its proper position in the guard rail assembly. If desired, dual-headed nails **132** may be driven through the nail holes **130** and into the kick board to prevent unintentional upward movement of the collars **124** on the posts **100.**

The invention is not to be limited to the exact arrangement of parts shown in the accompanying drawings or described in this specification as various changes in the details of construction may be resorted to without departing from the spirit or scope of the invention. For example, although the various metal-to-metal parts of the present stanchion supporting bracket **16** have been illustrated and described herein as being removably fastened together by the use of fast pins such as the pins **60** and **106,** it is contemplated that if desired conventional nut and bolt assemblies may be substituted therefor. Therefore, only insofar as the invention is particularly pointed out in the accompanying claims is the same to be limited.

Having described the invention what we claim as new and desire to secure by Letters Patent is:

1. A stanchion supporting bracket adapted to be removably clamped to a drop-off edge of an upper story level concrete floor slab or the like, said bracket comprising a pedestal having a foot member projecting laterally from the lower end thereof, a socket member projecting laterally from said pedestal above the level of said foot member and opposing the latter, said socket member being in the form of a loop of flat metal stock and having sides which straddle the pedestal and a bight portion which is spaced outwardly from said pedestal, an upper jaw plate extending across the lower edges of the loop sides in overhanging relationship, said foot member and upper jaw plate being adapted to receive the edge region of the slab therebetween with the former underlying the slab and the latter overlying the slab, and a pair of clamping screws threadedly received in the overhanging portions of said jaw plate, projecting downwardly therefrom and adapted when tightened against the upper face of the slab to draw the foot member into clamping engagement with the slab, said socket member and upper jaw plate defining an upwardly opening socket designed for reception therein

of the lower end of a vertical guard rail supporting stanchion post.

2. A stanchion supporting bracket as set forth in claim 1 and wherein said pedestal is square in transverse cross section, the socket which is established by the loop sides, bight portion, pedestal and jaw plate is rectangular and designed for reception therein of the lower end of a wooden stanchion board, and the loop sides are provided with nail holes therethrough for the reception of nails by means of which the stanchion board may be secured in said socket.

3. A stanchion supporting bracket as set forth in claim 2 and wherein the bight portion has formed therein a vertically disposed slot which affords a clearance area for passage therethrough of nails by means of which a kick board may be secured in position against the outer surface of the bight portion.

4. A stanchion supporting bracket as set forth in claim 3 and wherein the foot member on the lower end of said pedestal is in the form of a loop of flat metal stock having parallel side legs the distal end regions of which are welded to the pedestal, and a lower jaw plate extends across the upper edges of said side legs and is designed for clamping engagement with the underneath side of the slab.

5. A stanchion supporting bracket as set forth in claim 3 and wherein said loop which in part defines said socket is a closed loop which encompasses the pedestal, the pedestal is provided with a series of vertically spaced pin-receiving openings therein, and the sides of said loop have formed therein pin-receiving holes for selective register with the openings in the pedestal, whereby the loop may be secured to the pedestal in selected positions of elevation with respect to the foot member.

6. A stanchion supporting bracket as set forth in claim 3 and wherein said upper jaw plate is provided with front and rear downturned edge flanges, the bight portion of said loop is flat, and the rear edge flange lies in the same vertical plane as said bight portion of the loop.

7. In a guard rail assembly, the combination of a stanchion supporting bracket adapted to be removably clamped to a drop-off edge of an upper story level concrete floor slab or the like, said bracket comprising a pedestal having a foot member projecting laterally from the lower edge thereof, a socket member projecting laterally from said pedestal above the level of said foot member and opposing the latter, said foot member and socket member being adapted to receive the edge region of the slab therebetween with the former member underlying the slab and the latter member overlying the slab, a clamping screw threadedly received in said socket member and projecting downwardly therefrom and capable of being tightened against the upper face of the slab to draw the foot member into clamping engagement with the slab, said socket member defining an upwardly opening socket, a cylindrical stanchion post having its lower end region fixedly secured in said socket, a collar vertically slidable on said stanchion post, and a kick board retainer secured to said collar and bodily movable therewith, said retainer having a downwardly projecting kick board confining element which is rearwardly offset from the stanchion post and, when the collar is in its lowermost position on the post, defines in combination with said socket member a kick board retaining space.

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