United States Patent

[11] 3,554,495

[72] Inventors **David Bach**
2601 N.E. 55th Court;
Walter Rothman, 2801 N.E. 51st St., Fort Lauderdale, 33308; Carlos Manuel Pascual, 571 N.W. 49th Ave., Plantation, Fla. 33313

[21] Appl. No. **807,043**
[22] Filed **Mar. 13, 1969**
[45] Patented **Jan. 12, 1971**

[54] **PRECAST CONCRETE RAIL CONSTRUCTION**
6 Claims, 12 Drawing Figs.

[52] **U.S. Cl.** **256/19**
[51] **Int. Cl.** **E04h 17/16**
[50] **Field of Search** 256/19, 21, 24, 59, 65

[56] **References Cited**

UNITED STATES PATENTS

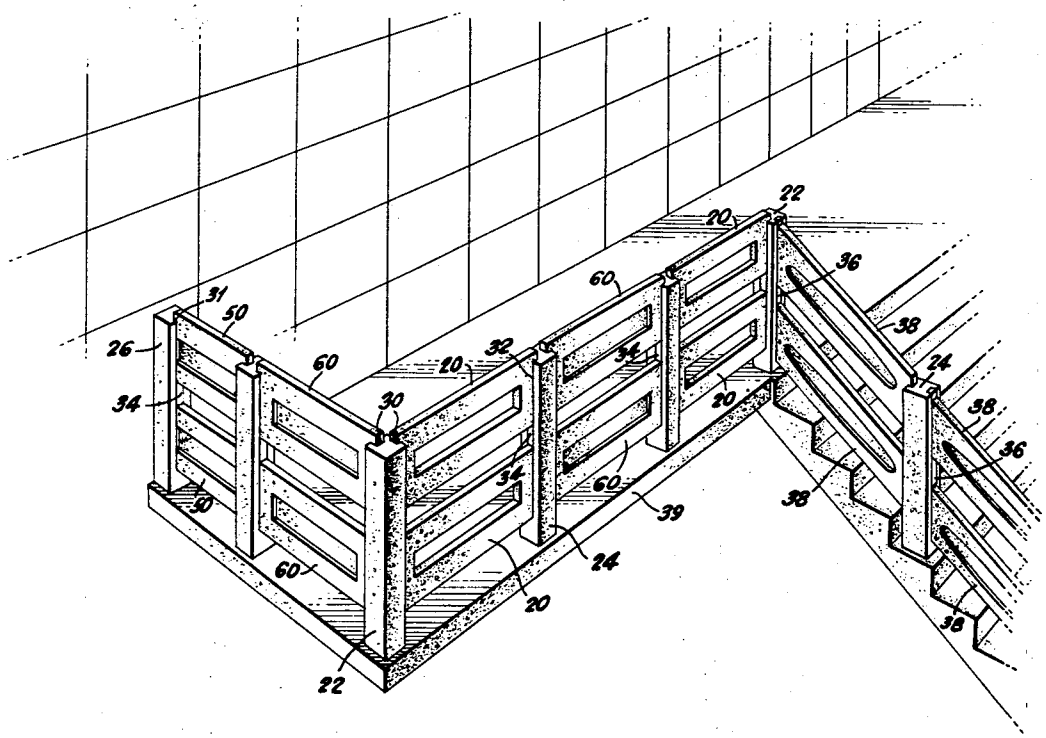
1,215,356	2/1917	Emerick	256/59
1,247,107	11/1917	Graham	256/19
1,774,784	9/1930	Allain	256/19
2,745,638	5/1956	O'Connor	256/19
3,193,255	7/1965	Burdett	256/19

FOREIGN PATENTS

222,827	1/1958	Australia	256/19

Primary Examiner—Dennis L. Taylor
Attorney—Stevens, Davis, Miller & Mosher

ABSTRACT: A precast concrete post and panel assembly, the posts having vertical grooves to hold the panels between them so that the panels can be slid into place after the posts have been erected. Concrete spacers are provided to provide vertical spacing between panels supported by the same pair of posts.



PATENTED JAN 12 1971

3,554,495

SHEET 1 OF 3

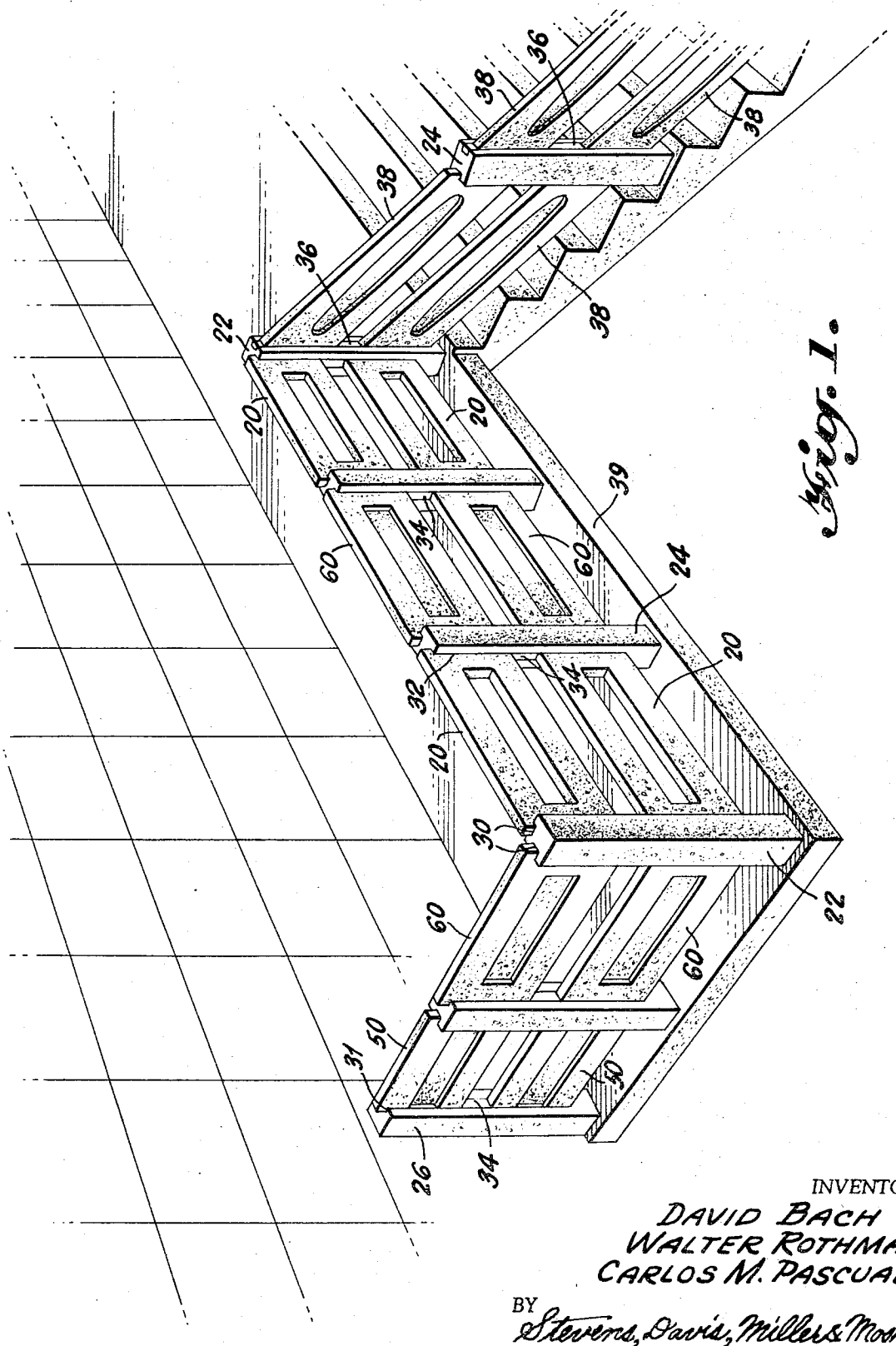
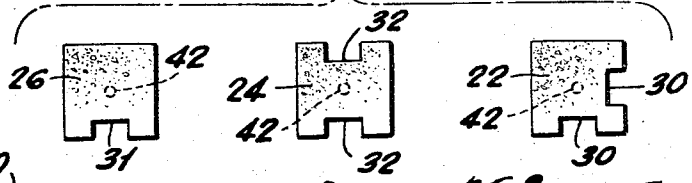


Fig. 1.

INVENTORS
DAVID BACH
WALTER ROTHMAN
CARLOS M. PASCUAL

BY
Stevens, Davis, Miller & Mosher
ATTORNEYS

Fig. 2.



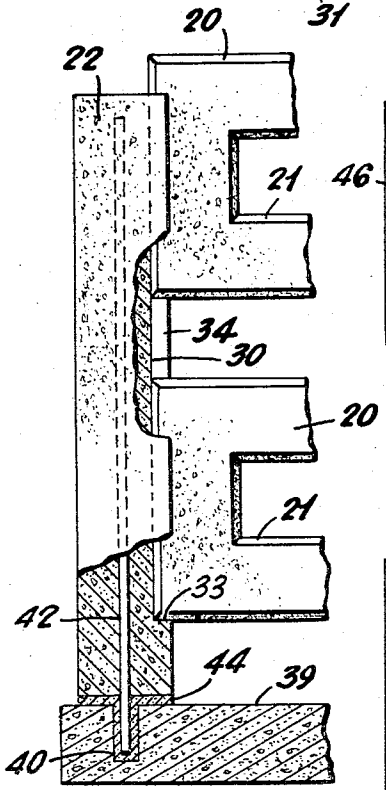


Fig. 3.

Fig. 4.

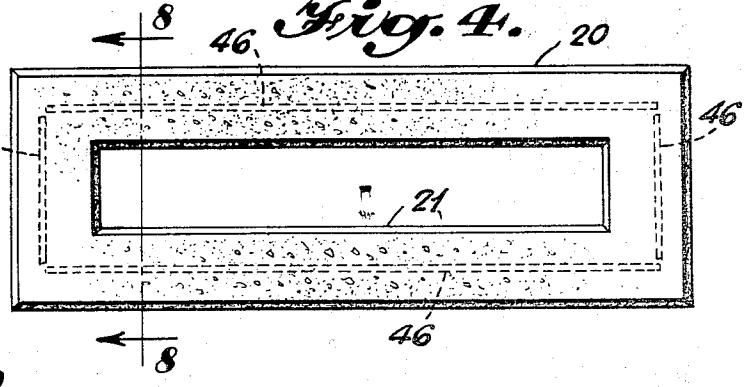


Fig. 5.

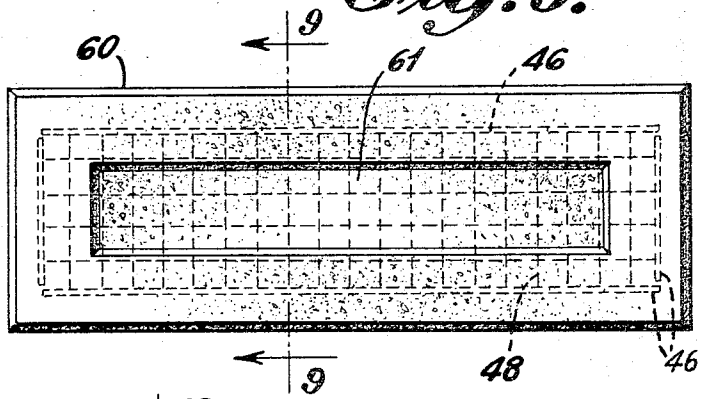
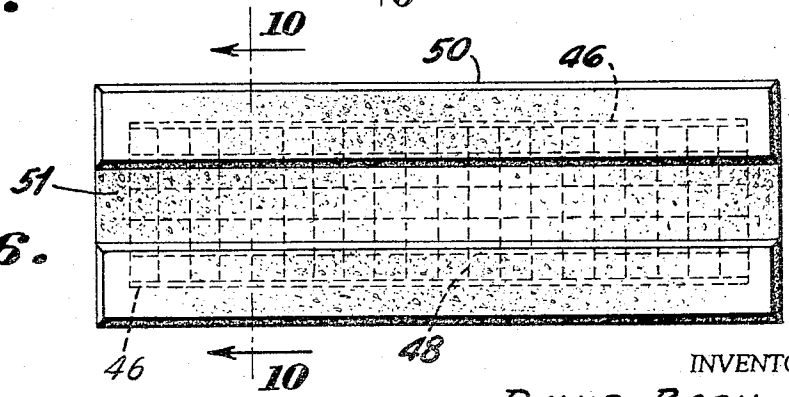


Fig. 6.



INVENTORS
DAVID BACH
WALTER ROTHMAN
CARLOS M. PASCUAL

BY
Stevens, Davis, Miller & Mosher
ATTORNEYS

Fig. 7.

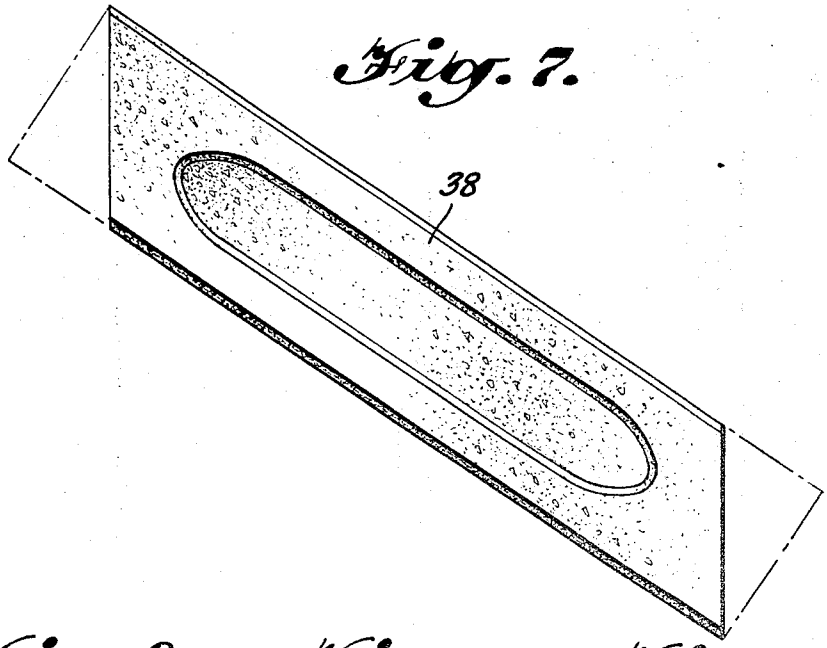


Fig. 8.

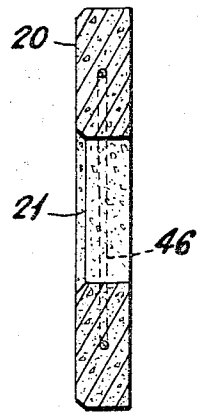


Fig. 9.

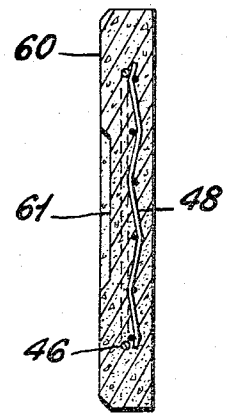


Fig. 10.

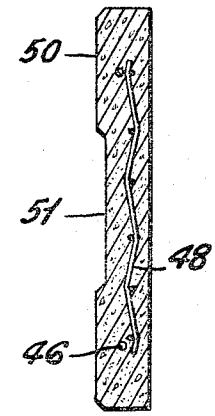


Fig. 11.

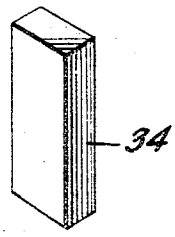
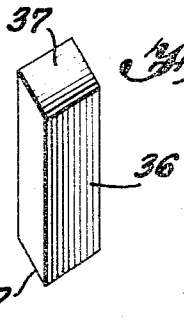


Fig. 12.



INVENTORS
DAVID BACH
WALTER ROTHMAN
CARLOS M. PASCUAL
BY Stevens, Davis, Miller & Mosher
ATTORNEYS

PRECAST CONCRETE RAIL CONSTRUCTION

DISCLOSURE OF THE INVENTION

This invention relates to a precast railing assembly and more particularly to such an assembly which can also be utilized for ornamental purposes. Such railings are usually used on the exterior of buildings as a safety rail for balconies and stairs, etc. In modern building construction it is often desirable to have a balcony along the entire length of an exterior wall, the balconies for individual rooms or apartments usually being separated from each other by the same type of railing that is used along the edge of the balcony as a safety measure. In such construction it is desirable to have a railing which is easily secured in place, economical to manufacture and capable of withstanding both aging deterioration and the effects of high winds and adverse weather.

It is an object of this invention to satisfy the foregoing requirements by fabricating an easy to assembly railing of concrete material. It is also contemplated that other materials such as plastics or metals, for example aluminum, could be used.

It is the further object of this invention to provide a railing assembly which is of high strength and durability but is yet easy to assembly and finish in place on a job site by relatively unskilled installers.

It is a further object of this invention to eliminate the need for any structural cap at the top of the railing as is now required with present precase railing assemblies.

To achieve the foregoing objects, the present invention comprises a precast reinforced concrete post and railing assembly wherein the posts are anchored to the flat surface by a steel dowel protruding from the bottom of each post and wherein the railing is formed from pairs of spaced panels slidably inserted into grooves along the surfaces of two adjacent posts.

Other objects and advantages of this invention will become apparent upon a review of the drawings which form a part hereof and illustrate the best mode presently contemplated for carrying out the invention. In the drawings:

FIG. **1** is a perspective view of an overall assembly showing typical panels for both horizontal and stair construction along with the accompanying posts;

FIG. **2** is a top view of the three types of posts used in connection with this invention;

FIG. **3** is a side elevation, partially in section, of a typical corner post showing two panels assembled therein and separated by a spacer between them;

FIG. **4** is a front view of a typical open panel used in the construction of this invention;

FIG. **5** is a solid panel used in construction of this invention;

FIG. **6** is a return panel used in construction of this invention;

FIG. **7** is a typical panel of the type used for slanting stair railings;

FIG. **8** is a sectional view taken along line **8–8** of FIG. **4**;

FIG. **9** is a sectional view taken along line **9–9** of FIG. **5**;

FIG. **10** is a sectional view taken along line **10–10** of FIG. **6**;

FIG. **11** is a typical spacer used for horizontal panels; and

FIG. **12** is a typical spacer used for inclined installations such as on a stair railing.

Referring now to the drawings in more detail, FIG. **1** shows an open panel **20** being supported by two posts **22** and **24**. Post **24** is a typical post having longitudinal grooves **32** on opposite sides thereof while post **22** is a corner post having longitudinal grooves **30** on adjacent sides thereof. Post **26** is a return post having a longitudinal groove **31** on only one side thereof. The configurations of these three posts can be seen by reference to FIG. **2** which shows these posts from a top view. Two panels **20**, of identical construction, are held in place between posts **22** and **24** merely by sliding them down in grooves **30** and **32** respectively. Since neither of these grooves run to the bottom of the post the panel section is prevented from sliding all the way down to the bottom. The two panels

are vertically spaced apart by spacers **34** (see FIG. **11**). Grooves **30**, **31** and **32** of the respective posts extend to a point short of the bottom end of the post and provide a supporting shoulder **33** for the lower panels of the railing.

In the case of stair panel sections which are cut on a slant, a spacer **36** which has inclined end surfaces **37** thereon to approximate the angle of inclination of the stairs (see FIG. **12**). The spacers may be of any appropriate length.

Panel **38** is a modified form of a panel having an elliptical or any other appropriate decorative embodiment embossment or recess therein. It should be understood that these panels can also be made with an open construction, or with different openings and shapes for varied architectural effects.

Referring now to FIG. **3**, it can be seen that typical post **22** has a steel reinforcing rod **42** projecting therefrom so that it can be secured in a hole **40** in the concrete base or floor **39** of a balcony. The steel reinforcing rod **42** is embedded within post **22** for most of its length and extends beyond the bottom end of the post to form a steel dowel ready to be embedded directly into a hole **40** in the floor **39** with suitable grout material which is of a high test nonshrinking character. One example of this material if "POR-ROK." Grout material would also be distributed between the bottom of the post and the deck surface of the balcony as shown in FIG. **3**.

FIG. **4** illustrates a panel **20** with an opening **21** formed therein, which may be of any suitable size or shape, and surrounded with reinforcing rods **46** embedded in said panel.

FIG. **5** illustrates a panel **60** with a recessed area **61** formed therein, which may be of any suitable size or shape.

Panel **60** is suitably reinforced with rods **46** and wire mesh **48**.

FIG. **6** illustrates a return panel **50** with a longitudinal recess **51** formed therein, the object being to provide a panel that can be cut at either end without destroying its symmetry. All of the panels are preferably provided with slightly beveled or rounded edges wherever desired to minimize chipping and to improve appearance.

FIG. **7** illustrates a stair panel construction showing that the panels are normally cast with square ends as shown in dotted lines thereon. These square ends are cut as required to suit the angle of inclination of the stair on the job during installation.

By way of illustration only and not as limitation, a typical panel can be about 3 feet 8 inches long and about 16 inches high. These panels can be cast of concrete about 2 inches thick while the grooves in the post are about 2¼ inches wide and 1⅛ inches deep in order to allow adequate room for sliding the panels into the grooves. The posts can be about 6 inches square so that a center to center measurement between adjacent posts is 4 feet 0 inches. In a typical construction the bottom panel is slid in first between two posts which have already been vertically positioned with the proper dimension between them, two spacers are inserted, one on each side, and then the top panel is slid into place to rest on the spacers. The entire assembly is then sealed together by means of a cement and sand and water grout, or in cases where extreme weather will be encountered by a high strength nonshrinking grout.

We claim:

1. A precast reinforced concrete post and railing assembly for installation of concrete balconies, walkways and stairways comprising at least one return post and at least one typical post, each of said posts being of uniform rectilinear cross section and having embedded therein coaxial with the longitudinal axis thereof a steel reinforcing rod which extends below the bottom of each post to form a dowel to anchor said post to the flat surface of said balcony, walkway or stairway, said return post having a longitudinal groove to slidingly receive the said railing assembly centrally located along one face of said post, said groove extending through the top surface of said post and along said face to a predetermined distance from the bottom of said post to form a shoulder to support the bottom edge of the said railing assembly when slidingly inserted therein, said groove being of a width slightly in excess of the thickness of said comprising and of a depth sufficient to

prevent the assembly from being moved laterally out of said groove, each of said typical posts having one of said longitudinal grooves on each of two opposed faces, said posts being anchored on said flat surfaces with the grooves in each post facing each other; said railing assembly comprising a pair of spaced panels slidingly interposed in said grooves, each of said panels having a rectilinear shape comprising an upper, a central and a lower portion, the upper and lower portions each having a reinforcing rod centrally embedded therein along the longitudinal axis of each portion, the central portion selectively being recessed on at least one surface or having an opening therein, the width of said recess or opening being substantially not greater than one-third the width of the panel, said panel being of a length greater then the distance between the opposing faces of two posts but less than the distance between the bottom of the groove in each opposing post and being of a width less than one-half the length of said longitudinal grooves so that when said pair of panels are slidingly positioned between any two adjacent posts said upper portion of the uppermost panel projects above the top of said posts, said panels having a thickness in at least said upper and lower portions which is slightly less than the width of said groove but provides the minimum required thickness of concrete on each side of said reinforcing rods therein; and vertical spacers interposed between said panels, said spacers each comprising a concrete block having a width equal to the thickness of said panel, a thickness equal to the depth of said groove and a length substantially equal to the distance between said panel supporting shoulder in said groove and the lower end of said post, said spacer being adapted to be inserted into each groove in each post between said pairs of panels, the ends of said spacers further having a construction adapted to maintain said pairs of panels parallel to the inclination of the surface along the edge of which said assembly is installed.

2. The post and railing assembly according to claim 1 wherein said panel further comprises a reinforcing rod centrally embedded interiorly across each end thereof to interconnect the like ends of the longitudinal reinforcing rods in the upper and lower portions of said panel, said panel having an opening in the central portion thereof, the length of said opening being such as to provide a solid section at each end of said central portion having a length at least equal to the width of said central portion and a thickness equal to the thickness of said panel.

3. The post and railing assembly according to claim 1 wherein said panel further comprises a sheet of galvanized mesh wire centrally positioned interiorly across the width of said panel and interconnecting said longitudinal reinforcing rods, the central portion of said panel having at least one recessed surface of a length equal to the length of said panel.

4. The post and railing assembly according to claim 3 wherein the said recess in said central portion of said panel is of a length sufficiently less than the length of said panel so as to provide a solid section at each end of said central portion having a length at least equal to the width of said central portion and a thickness equal to the thickness of said panel, said panel further having centrally embedded therein across each end of a reinforcing rod interconnecting the like ends of the longitudinal reinforcing rods in the upper and lower portions of said panel.

5. The post and railing assembly according to claim 1 wherein each of said panels is cut into the shape of a parallelogram from the rectangular shape so that the longitudinal axis of the panel will be parallel to the inclination of the surface upon which the assembly is being installed, the width of said panel being substantially equal to one-third the length of said groove and wherein said spacers for installation of the assembly on an inclined surface have end portions inclined at the same angle as said inclined surface, said spacers further being of a length such that the upper portion of the uppermost panel will project above the tops of said posts a distance equal to the projection of the uppermost panel in an installation on a horizontal surface.

6. The post and railing assembly according to claim 1 wherein said return post has one of said longitudinal grooves on each of two contiguous faces, said return post being anchored to said flat surface to receive pairs of panels extending at right angles to each other.

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,554,495 Dated January 12, 1971

Inventor(s) David BACH, Walter ROTHMAN and Carlos Manuel PASCU

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Claim 1 (Column 2, line 75) should read at line 75:

--thickness of said assembly and of a depth sufficient to-

Signed and sealed this 15th day of June 1971.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

WILLIAM E. SCHUYLER, JR
Commissioner of Patents