



US 20030167701A1

(19) **United States**

(12) **Patent Application Publication**
Rich

(10) **Pub. No.: US 2003/0167701 A1**

(43) **Pub. Date: Sep. 11, 2003**

(54) **PORCH APPARATUS FOR MODULAR
STRUCTURES WITH ADJUSTABLE STAIR
AND HANDRAIL ASSEMBLY**

(52) **U.S. Cl. 52/79.6; 52/184; 52/263; 256/65.02;
182/113**

(76) **Inventor: Rolland Wayne Rich, Albany, GA (US)**

Correspondence Address:

Brain D. Bellamy

P.O. Box 1997

Thomasville, GA 31799-1997 (US)

(21) **Appl. No.: 10/176,267**

(22) **Filed: Jun. 20, 2002**

Related U.S. Application Data

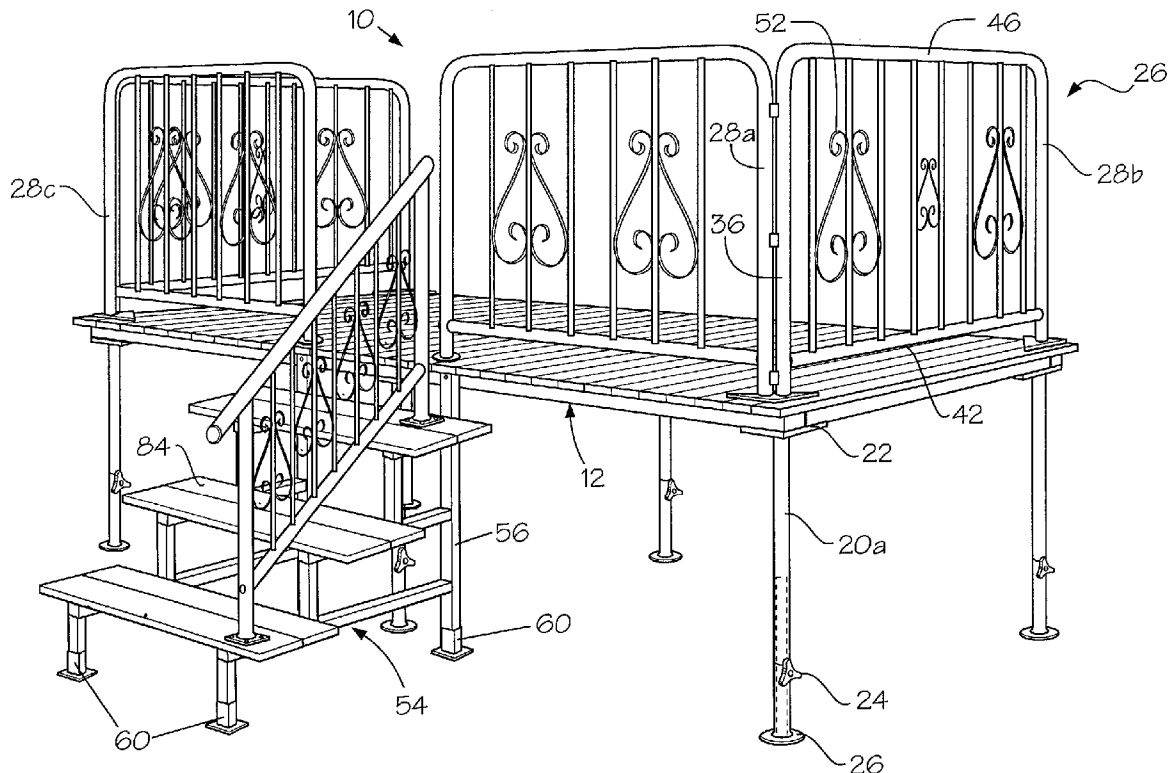
(60) **Provisional application No. 60/361,831, filed on Mar.
5, 2002.**

Publication Classification

(51) **Int. Cl.⁷ E04B 1/58; E04F 11/18**

(57) **ABSTRACT**

A modular and dismantlable porch apparatus including a deck frame for supporting decking material, a handrail assembly attached about the circumference of the deck frame, an modular step assembly attached to the deck frame, and a modular handrail assembly attached to the step assembly. The deck frame is constructed of a plurality of support members having swaged ends that interlock to form a rectangular body. The step assembly is constructed of step frame members that may be added as needed to add additional steps. The handrail assembly also provides a modular design using handrail segments with swaged ends in which additional rail segments may be added to accommodate the length of the completed step assembly.



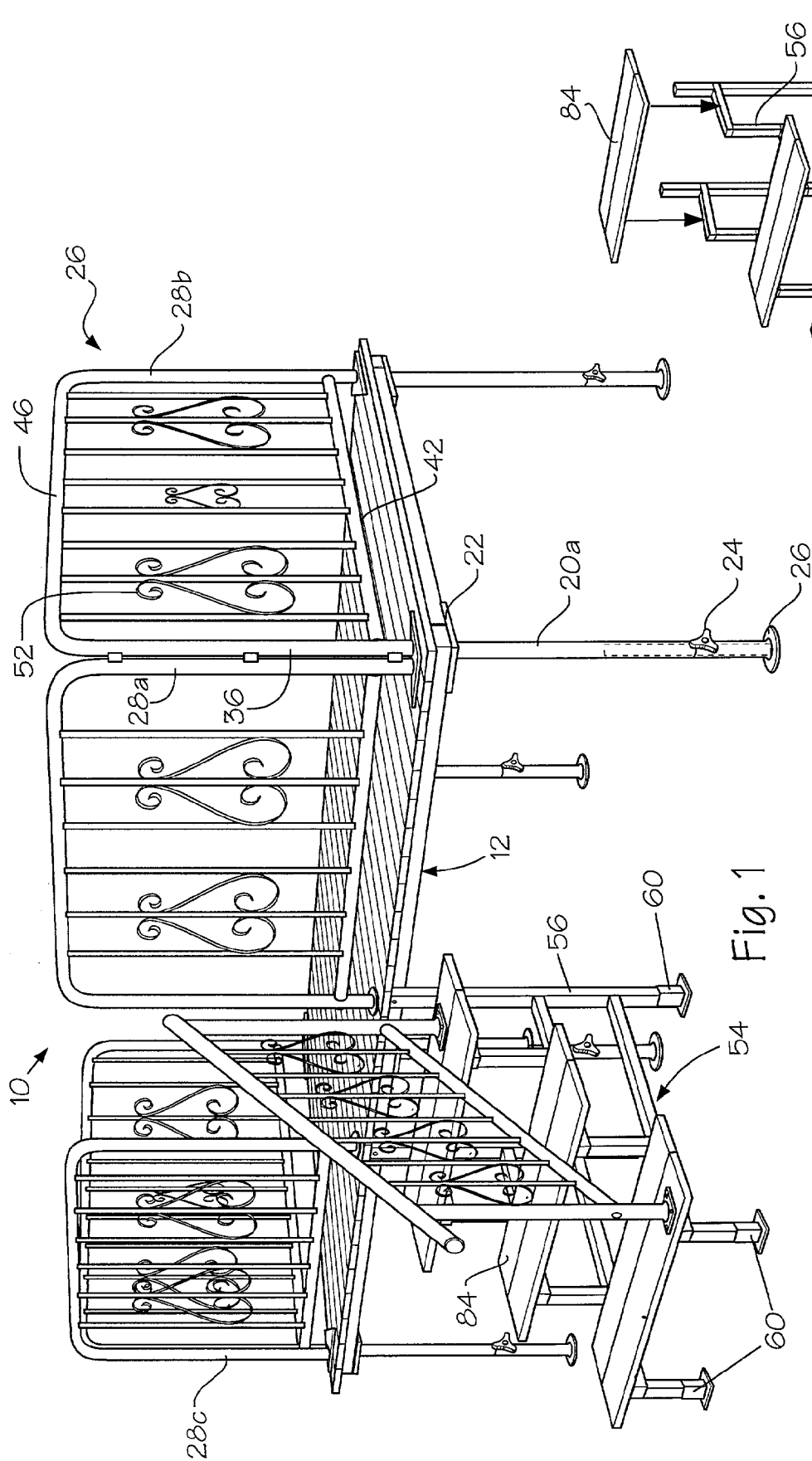


Fig. 1

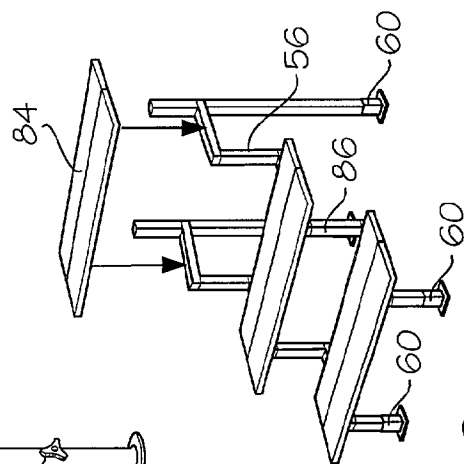


Fig. 2

Fig. 3

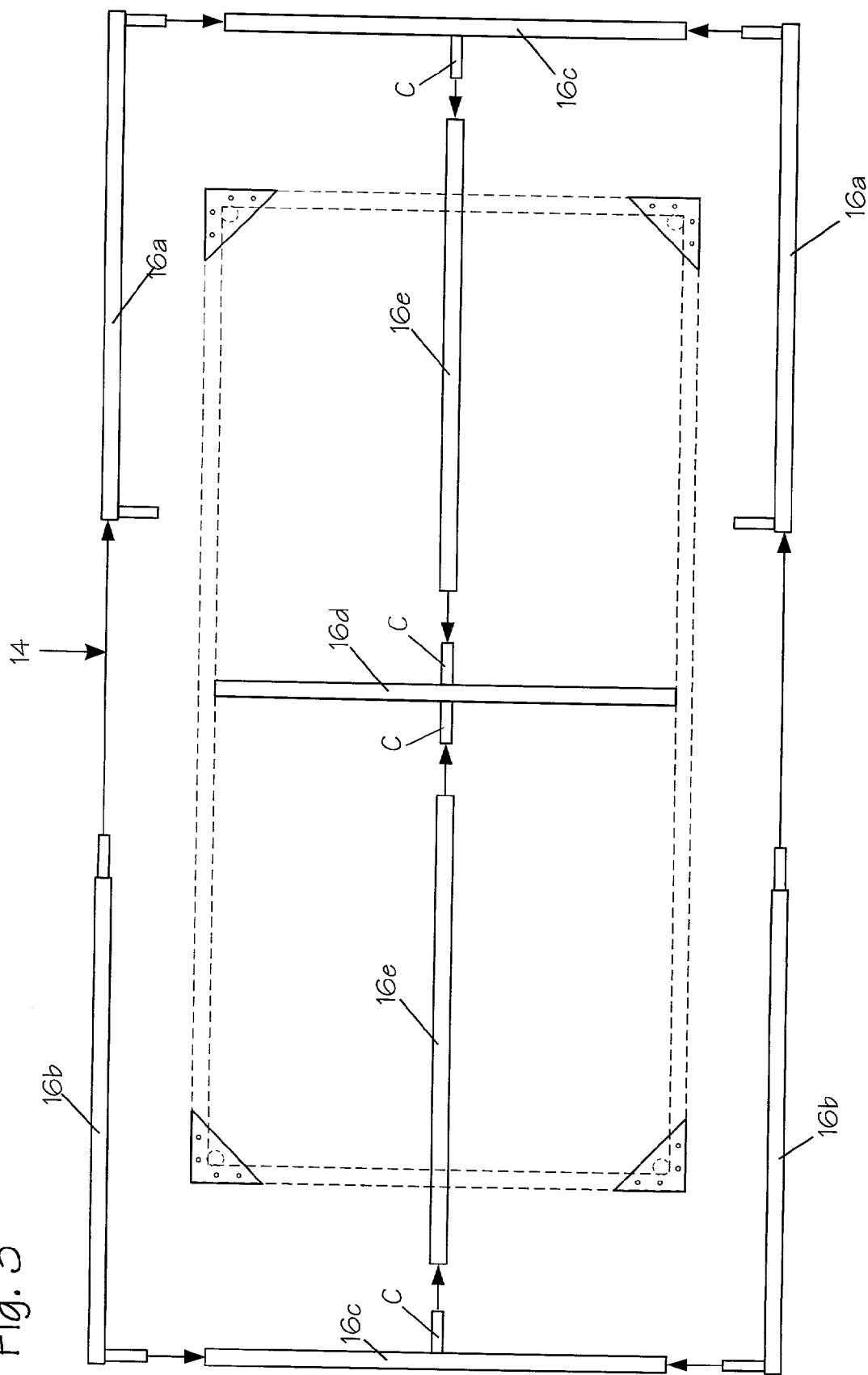
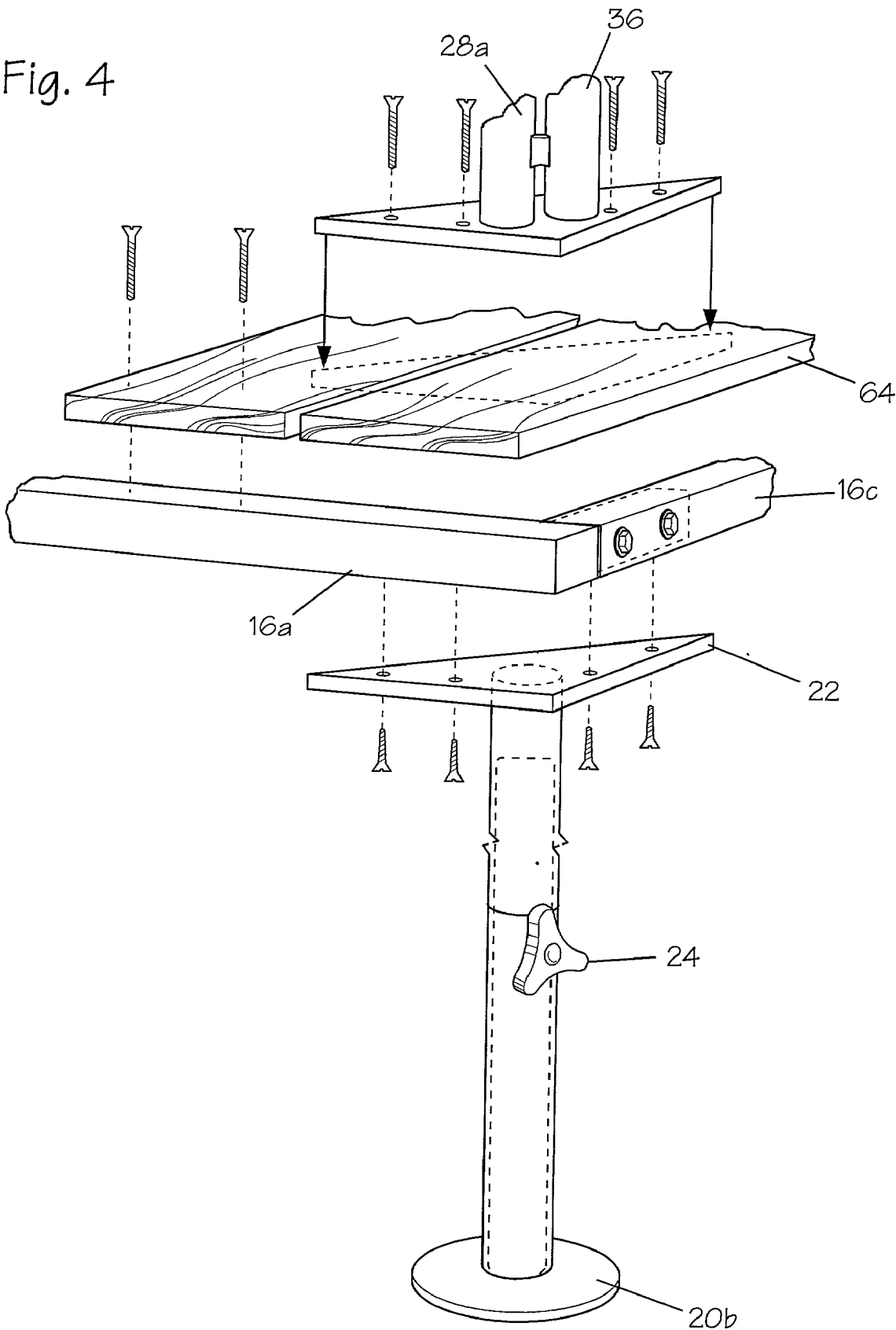


Fig. 4



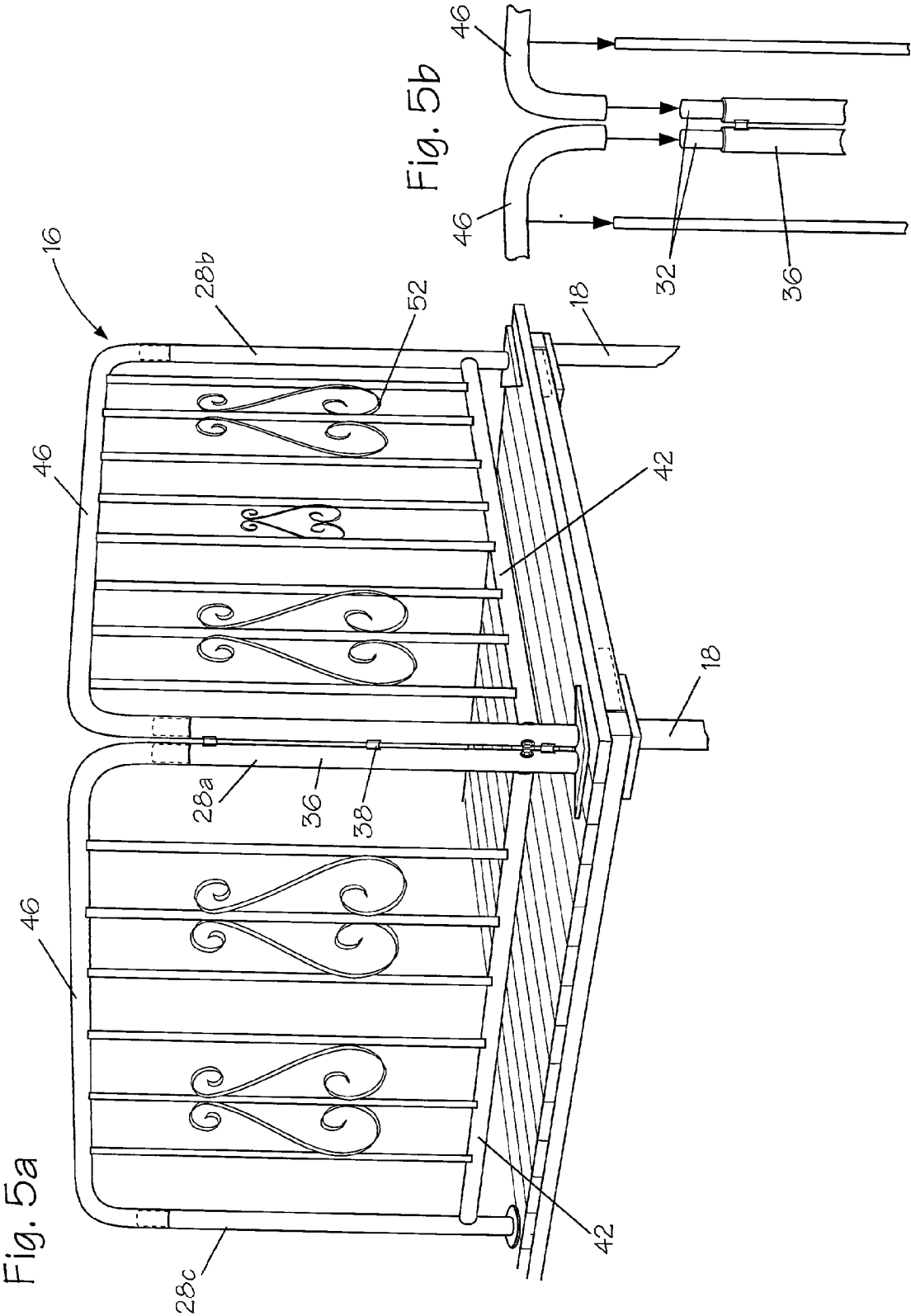


Fig. 6a

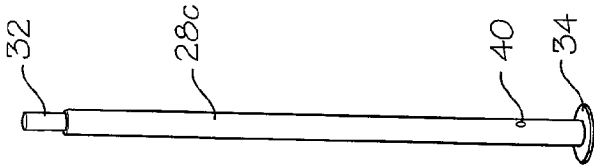


Fig. 6b

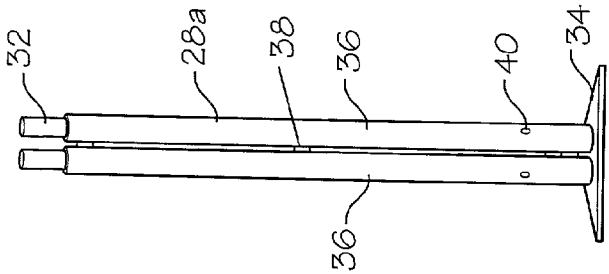


Fig. 6c

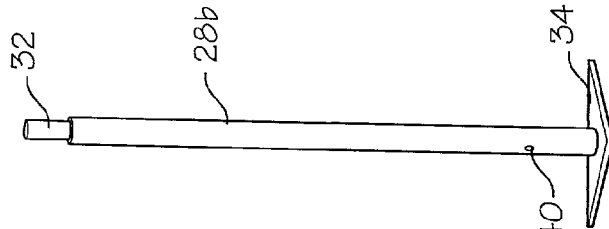


Fig. 7a

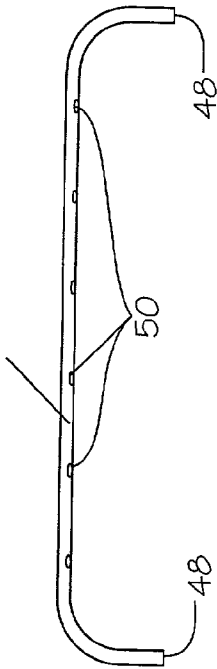


Fig. 7b

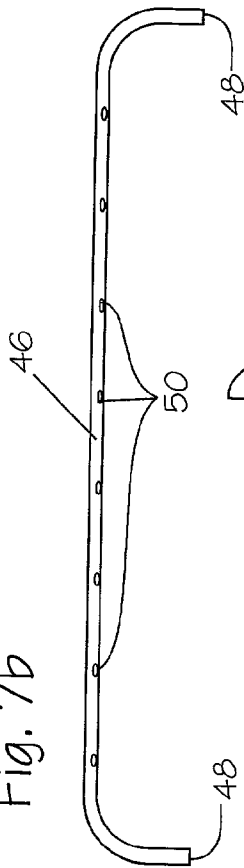


Fig. 9

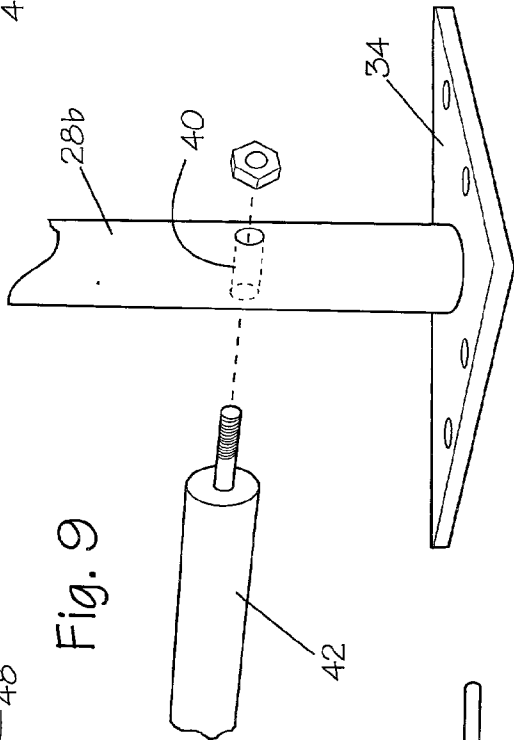


Fig. 8a

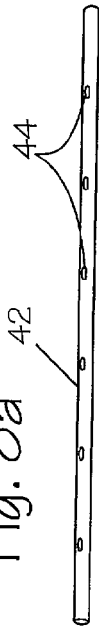


Fig. 8b

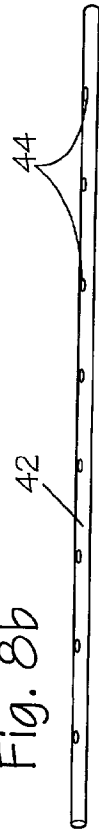
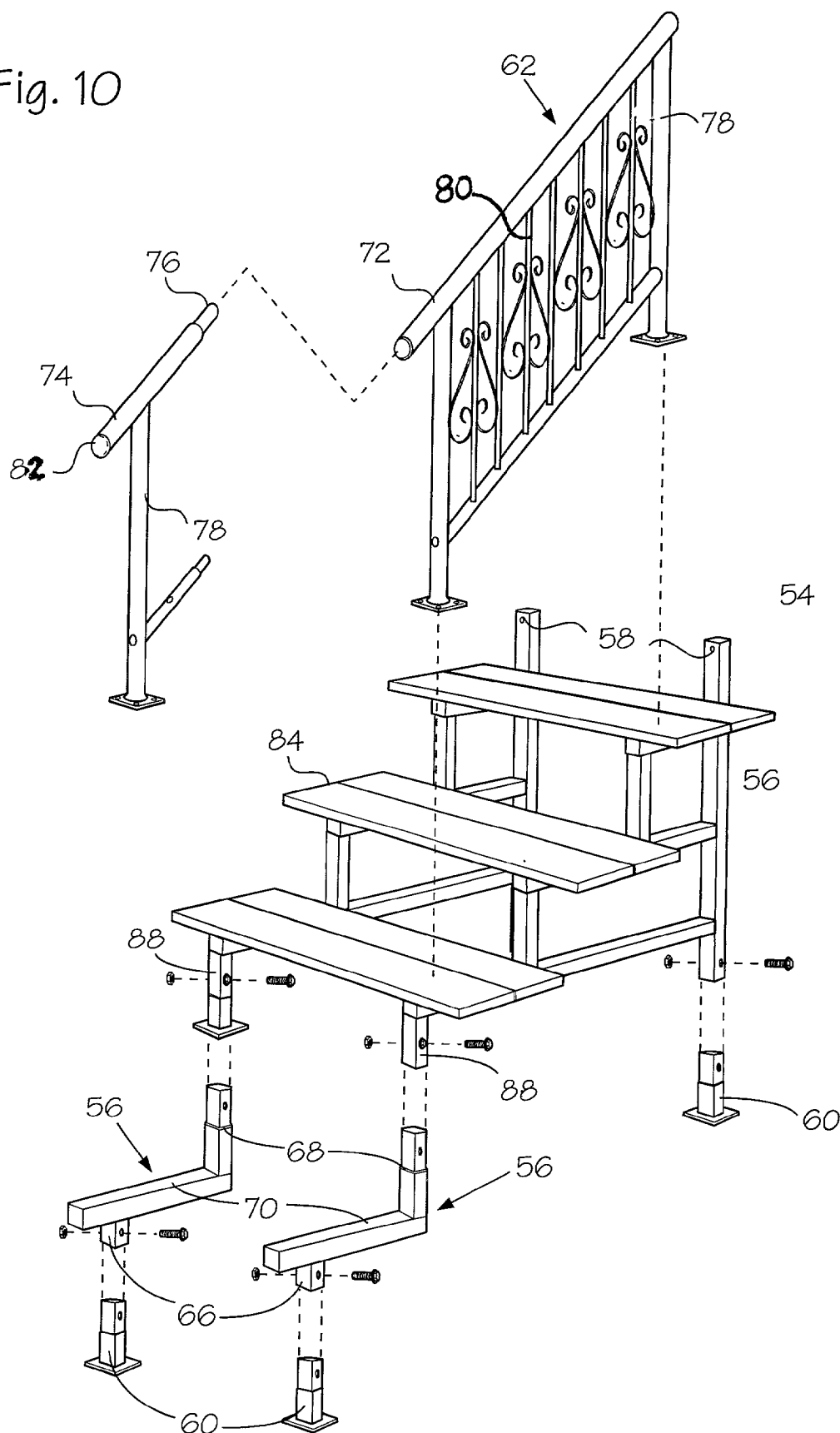


Fig. 10



**PORCH APPARATUS FOR MODULAR
STRUCTURES WITH ADJUSTABLE STAIR AND
HANDRAIL ASSEMBLY**

PRIORITY CLAIM

[0001] The present application claims benefit of U.S. Provisional Application No. 60/361,831 filed on Mar. 5, 2002.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates generally to deck assemblies and more particularly to a portable deck apparatus designed and configured to be easily and successfully installed and/or dismantled by providing an apparatus with a frame system that is adapted to be altered in size so as to accommodate any modular structure.

[0004] 2. Description of the Prior Art

[0005] Modular structures, such as mobile homes or the like, generally have one or more doors for providing access into the particular dwelling. Generally, these doorways are situated substantially above ground and entrance to the door requires the use of steps. The steps that are often provided with the modular structure lack a porch area, and in addition these steps tend to be small in size and structurally unstable. Thus, this conventional design inherently provides an entrance system that can be inadequate and precarious especially for the elderly, toddlers and those with limited dexterity.

[0006] In the past, adding a porch to a modular structure required a custom-built installation, which could be costly. Should the modular structure be relocated, the porch must be dismantled. Disassembling the custom-built porch can be a tedious and laborious process, especially if trying to salvage the components. Storage and transportation can also be a concern, since the salvaged components are varied in size and shape, thus providing items that are bulky and awkward to handle. In addition, due to the various slopes and elevations of the ground, the prior material used for the custom-built deck may not be useable for the new location of the modular structure since the ground structure will not be identical to the previous site.

[0007] As such, modular ready to assemble decks and porches for use with modular structures have been developed. For example in U.S. Pat. No. 5,784,837 there is disclosed a collapsible transportable deck having a framework that includes ground-engaging wheels mounted for rotation at the bottom of the framework. A coupling at the front of the deck is used to facilitate connecting the deck to a towing vehicle. Thus, rendering a deck that is adapted to be towed to a desired location for use.

[0008] Another modular porch for use with a mobile home that addresses a solution to the problems associated with varying slopes and elevations of the ground is disclosed in U.S. Pat. No. 4,852,309 and in U.S. Pat. No. 3,808,757. In these patents there is disclosed a modular porch having vertically adjustable support legs, wherein, each leg is independently axially adjustable.

[0009] Though the modular units described above may be successful, they offer assemblies that tend to be numerous in

components and complex in design. Due to the excessive number of elements, installation and dismantling can be time-consuming and frustrating.

[0010] Accordingly, it is seen that there is a need to provide a deck apparatus for a modular structure that is successful in operation, aesthetically pleasing when installed, yet simple to assemble and dismantle. The disassembled structure should be compact for rendering easy transportation capability. This deck apparatus should include a means for accommodating different types and styles of modular structures and varying elevations and slopes of the terrain.

[0011] As will be seen, the present invention achieves its intended purposes, objectives and advantages by accomplishing the needs as identified above, through a new, useful and unobvious combination of component elements, which is simple to assembled, with the utilization of a minimum number of functioning parts, at a reasonable cost to manufacture and by employing only readily available material.

SUMMARY OF THE INVENTION

[0012] The present invention is a modular and easy to assemble porch apparatus for use with a modular structure. In a disassembled state, the porch apparatus is compact for rendering a unit that can be transported easily and one that does not require an excess amount of space for storage. This porch apparatus is simple in design for reducing the time and effort for assembling and disassembling the deck, while not compromising on quality and structural stability. In addition, to increase its versatility, this porch apparatus is designed and configured to vertically adjust in order to fit any modular home and accommodate any elevation and slope of terrain, innately providing a deck that is leveled, aesthetically pleasing and structurally sound.

[0013] The present invention provides a modular porch apparatus for use with modular structures. The porch apparatus comprises a deck assembly having an adaptable stair assembly coupled thereto and an adaptable handrail assembly coupled to the stair assembly. The deck assembly comprises a frame member that is adapted to support and receive flooring for the porch. Removably secured to the frame are independently adjustable legs. Secured to the flooring, opposite from the legs, is the vertical railing. The frame member and railings include interlockable members that facilitate the assembly and disassembly process. The stair assembly, having vertically adjustable legs, is secured to the frame member.

[0014] Other features can be added for enhancing the final porch assembly. These features include, but are not limited to; providing a roughen surface on the steps and/or deck, providing a canopy over the deck area. The adjustable step assembly includes the ability to add additional steps to the step structure, and the adjustable handrail system on the steps provides the ability to adapt a correct length handrail apparatus to step assembly depending on the desired height of the steps.

[0015] Accordingly, it is an object of the present invention to provide a modular porch apparatus that will overcome the deficiencies, shortcomings, and drawbacks of prior modular porches and methods thereof.

[0016] Another object of the present invention is to provide a porch apparatus that is easy to assembly and disas-

semble and one that can accommodate any modular structure and terrain elevation, ultimately providing a well structured and leveled porch.

[0017] Yet a further object of the present invention, to be specifically enumerated herein, is to provide a porch apparatus in accordance with preceding objects and which will conform to conventional forms of manufacture, be of simple construction, fabricated from durable and anti-corrosive material and easy to use so as to provide a dismantlable porch apparatus that would be economically feasible, long lasting and relatively trouble free during utilization.

[0018] Although there have been many inventions related to dismantlable porch apparatus, none of the inventions have become sufficiently compact, low cost, or reliable enough to be utilized. The present invention meets the requirements of the simplified design, compact size, low initial cost, ease of installation and maintainability, and minimal amount of training to successfully assembly and dismantle the invention.

[0019] The foregoing has outlined some of the more pertinent objects of the invention. These objects should be construed to be merely illustrative of some of the more prominent features and application of the intended invention. Many other beneficial results can be obtained by applying the disclosed invention in a different manner or modifying the invention within the scope of the disclosure. Accordingly, a fuller understanding of the invention may be had by referring to the detailed description of the preferred embodiments in addition to the scope of the invention defined by the claims taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] FIG. 1 is a perspective view of the assembled dismantlable porch apparatus of the present invention.

[0021] FIG. 2 is a perspective view partially exploded to show the assembly of the stair unit used in combination with the assembled porch shown in FIG. 1.

[0022] FIG. 3 is a top view of the components used in the frame member for the deck assembly of the dismantlable porch apparatus of the present invention.

[0023] FIG. 4 is a sectional perspective view from the lower front right-hand corner of the porch apparatus exploded to illustrate the assembly thereof.

[0024] FIG. 5a is a sectional perspective view of the assembled porch apparatus showing the assembly thereof in enhanced detail.

[0025] FIG. 5b is a sectional perspective view from the upper front right-hand corner of the porch apparatus exploded to illustrate the assembly thereof.

[0026] FIG. 6a is a plan view showing the leftmost vertical railing support member.

[0027] FIG. 6b is a plan view showing the right front vertical railing support members.

[0028] FIG. 6c is a plan view showing the right rear vertical railing support members.

[0029] FIG. 7a is a plan view showing a first upper horizontal railing member.

[0030] FIG. 7b is a plan view showing a second upper horizontal railing member.

[0031] FIG. 8a is a plan view showing a first lower horizontal railing member.

[0032] FIG. 8b is a plan view showing a second lower horizontal railing member.

[0033] FIG. 9 is a sectional perspective exploded view showing the assembly of the lower horizontal railing member to a vertical railing support member.

[0034] FIG. 10 is an exploded perspective assembly view showing the assembly of the modular stair handrail assembly and step assembly.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0035] With reference to the drawings, the present invention, a dismantlable and modular porch apparatus, denoted by reference numeral 10 will be described. Shown is a porch apparatus 10 designed and configured to fit and accommodate any size modular structure, such as a mobile home. The present invention is an apparatus that is easy to install and one that will successfully provide a porch apparatus that is level and aesthetically pleasing. As seen in FIG. 1, the dismantlable porch apparatus comprises a deck assembly 12 having a stair assembly 54 coupled thereto, and optionally, a handrail assembly 62. Most of the parts in each assembly include male ends, such as 32 and 76, that are swedged to have a reduced circumference or female ends for receiving the swedged ends and interlocking the parts together.

[0036] The deck assembly includes a main frame or deck frame 14 as shown in FIG. 3. The main frame 14 includes a plurality of support members 16a-16e that interlock with one another. Once appropriately coupled, the support members 16a-16e form the substantially rectangular main frame 14. To enable such a configuration, the support members 16a-16e include a plurality of altering configurations. One configuration provided is the use of a C-shape member. In the main frame, there will be a pair of C-shape members 16a having elongated tubular bodies. The outer perpendicular flanges of the C-shape member are male receiving ends. One end of this C-shape member includes a female receiving end. This female receiving end is perpendicularly located with respect to the male perpendicular flanges on each end.

[0037] Coupled to the C-shape members 16a, on the interior of the frame is a support member 16b having two male ends oppositely located. The first male end as seen in FIG. 3 is perpendicularly located with respect to the second male end. This second male end is adapted to be located in the female end of the first support member 16a.

[0038] Secured to each pair of outer male ends formed from the first support members 16a and the second support members 16b is an elongated support member 16c having a centrally located male end perpendicularly secured thereto, illustrated in FIG. 3. When coupled, the first, second and third support members will form a substantially rectangular configuration, as seen in FIG. 3. As shown, the central male ends of the elongated support member will be facing each other.

[0039] Mating the male ends of the first support member 16a is the use of a t-shape support member 16d, as seen in FIG. 3. This t-shape member has female receiving ends that receive the male ends of the first support members 16d, as seen in FIG. 3. Male ends extend outwardly from the member to form the t-shape. Coupling this t-shape member to the outer elongated member 16c is extended members 16e having outer female-receiving ends, illustrated in FIG. 3. Coupled, the t-shape member 16d and the pair of extended members 16e form a t-shape. To form the frame, all the members are aligned as shown in FIG. 3. Once aligned, each preceding end of each member is coupled with the subsequent end. This will provide for the preceding end to be coupled to the subsequent end and provide for the entire frame to be square and flushed. It is noted that additional support members can be utilized for increasing and/or decreasing the size of the porch and that the number and type of supports utilized is dependent upon the size and shape of the preferred porch.

[0040] To provide for the main frame 14 to be elevated, vertically adjustable legs 18 are provided, as shown in FIGS. 1 and 4. The legs comprise an upper end 20a and a lower end 20b. The upper end 20a includes a brace member 22, illustrated in detail in FIG. 4. Extending through the brace member 22 are pre-drilled apertures. These apertures are adapted to receive conventional securing elements. Located on the lower end 20b is an enlarged area that aids in supporting the main frame 14 when the legs are secured thereto. Each leg includes a conventional telescopic adjusting mechanism to allow the leg to independently adjust vertically. Once the desired height is reached, the leg is locked into place via conventional locking mechanisms 24.

[0041] The legs 18 are secured to the lower surface of the main frame 14 via conventional securing elements, such as self-tapping screws. As seen, the brace 22 is located at each corner of the frame and on each side joint. The apertures of the brace 22 will receive the conventional securing elements for rendering attachment thereto. For added stability, the center joints C can be secured via conventional securing elements, such as self-tapping screws.

[0042] Once the framed as been assembled, as seen in FIG. 1, the decking material 64 can be secured thereto. The decking material can be of any conventional form and in the preferred embodiment is conventional decking lumber. When installing the lumber, one end of the wood will be flushed with the end of the frame while the second end of the wood will overhang slightly with respect to the second end of the frame. Once the lumber has been placed on, it is secured to the frame 14 via conventional securing elements, such as self-tapping screws.

[0043] When the decking has been completed, the rail assembly can be mounted thereto. This rail assembly 26 is illustrated in FIGS. 1 and 5a. As illustrated, the rail assembly comprises vertical support members 28a, 28b, and 28c. These vertical support members will maintain the lower horizontal rail member 42 and the upper horizontal handrail member 46. The lower horizontal rail members and the upper horizontal handrail members will accept the balusters.

[0044] Each vertical support member 28a, 28b and 28c includes an upper portion having at least one male end 32, which is illustrated as swedged, and a lower portion including a brace 34. The brace includes pre-drilled apertures for

receiving conventional attaching devices, such as self-tapping screws. The brace can include the same shape and configuration, or optionally can include a configuration for optimizing its support. As seen corner braces will be triangular in shape and non-corner braces will be substantially square in configuration. Extending horizontally through the lower area of each vertical support member is a channel 40. The channel 40 is located in proximity to the brace and is configured to receive a conventional attaching device.

[0045] Exterior corners will receive the exterior corner support members 28a, interior corners will receive the interior corner support members 28b, and additional support members 28c will be located as necessary. Exterior corners are the corners that are not located adjacent to the home. Accordingly, each exterior corner pieces 28a will include a pair of vertical shafts 36, which are coupled via reinforcement members 38. This coupling provides added stability. Each upper end of each vertical shaft will include the male end, which will be swedged to provide a reduced circumference for insertion into a female open end. The lower end of each shaft will be secured to a singular brace.

[0046] Interior corners are the support members that are located adjacent to the home. The interior corner support members 28b include a singular vertical shape. Each upper end of each shaft will include the male end. The lower end will be secured to the brace.

[0047] Additional support members 28c will be utilized. These support members will be located at a particular distance from the exterior corner members and/or interior corner support members. This particular distance is predetermined by the manufacture. This distance is calculated upon size of the deck, appropriate support properties for lower railings 42, upper railings 46 and balusters 52. The additional supporting members 28c include a singular vertical shape. Each upper end of each shaft will include the male end. The lower end will be secured to the brace. The difference between the additional support member 28c and the interior support members 28b resides in the shape of the brace.

[0048] Accordingly, the corner support members will be secured to each corner of the decking. For securing to the decking, the user places the brace on the deck and secures it thereto by conventional attaching devices, such as self-tapping screws. The screws are placed into the existing holes located through the brace. Once the corner support members are secured aligned with the corner support member and are attached to the decking as defined above.

[0049] Lower railings 42 are used to receive the lower ends of the balusters 52. The lower railings 42 are elongated poles having a plurality of receiving apertures 44 located along one side thereon. The outer ends of the lower railing include openings for receiving a conventional attaching device. Thus the lower are situated between a pair of support members, with the receiving apertures 44 facing upwardly, opposite from the deck. The openings are aligned to the channels of the support member. Once aligned, a conventional attaching device is inserted in the channel of the support member and to the opening of the outer end of the lower railing. This will provide for the piece to be secured thereto. The process is continued with each end of each railing member to provide for the lower railings 42 to be secured thereto. It is noted that a gap will be located between

a pair of railing. The gap will provide for the pair of railing to be free from railings so as to provide an entrance to the decking assembly **12**. The stair assembly will be attached to this gap area.

[0050] After the lower railing is attached, the upper railing or top rail **46** is coupled to each pair of support members and above each lower railing **42**. The top rail includes a C-shape configuration wherein each outer flange member includes a female receiving portion **48**. Extending along the interior of the center member is a plurality of apertures **50** that are alignable with the apertures of the lower railing. Thus to be attached to the support members, the female ends of the upper railings **46** receive the male ends of the support member. This provides for the upper railing **46** to be secured to the supports **28a**, **28b** and/or **28c** and also provides for the plurality of apertures **50** of the upper railing **46** to be facing the plurality of apertures **44** from the lower railing **42**.

[0051] The balusters **52** are inserted into each pair of alignable holes located on the lower railing **42** and upper railing **46**. The balusters can have any shape, design or configuration. It is noted that the support members can be attached to the deck after the lower rail assembly has been secured to the upper rail assembly and the balusters have been inserted into the appropriate apertures.

[0052] Secured to the gap or opening of the rail assembly is the step assembly **54**. This step assembly is shown in FIGS. 1, 2, and 10a and 10b. As seen, the step assembly will include at least two step frame members **56**. The step frame members include a step configuration wherein the top includes a receiving opening **58** for receiving a conventional attaching element, such as a carriage bolt. The lower end includes telescoping legs **60** similar in design as to the legs **18** used to support and elevate the main frame **14**. Accordingly, each leg **60** includes a conventional telescopic adjusting mechanism to allow the leg to independently adjust vertically. Once the desired height is reached, the leg is locked into place via conventional locking mechanisms. Located on the lower end of each leg of the step frame is an enlarged area that aids in supporting the step assembly.

[0053] Each step frame member **56** includes a lower tubular member **66** for receiving the telescoping legs **60**. As well as receiving the telescoping legs, each lower tubular member of the step frame members may receive an additional step frame member **56**. Thereby, additional steps may be added to the step assembly **54**. The additional step frame member includes an upper tubular member **68** opposite a lower tubular member **66**, connected by the center step support member **70**. The upper tubular member **68** is received by the tubular opening of the above situated lower tubular member **66** of a second step frame member. Each of the joined step frame members are attached by conventional means similar to the means used in securing the telescoping leg member for interchangeability. A desired means for attaching the step frame members would include providing swedged ends for interlocking with female receiving ends. The telescoping legs **60** on the front of the step assembly **54** where the step assembly attaches to the modular structure are designed to telescope a sufficient distance to promote the addition of steps via the addition of step frame members. Thereby, the step assembly provides a simple and versatile means for accommodating modular structures with varying entryway heights.

[0054] The step frame members **56** are secured to the main frame **14** via conventional attaching elements. Once attached, the legs are adjusted and step decking is secured to the upper surface of the frame members **56**. The decking will be secured via conventional devices such as self-taping screws or the like.

[0055] Various features can be added for enhancing the final product. For example, a handrail assembly **62** can be provided and a canopy can be located above the decking for protection against all weather conditions. The addition of a handrail assembly **62** may be designed in conjunction with the step assembly **54** to accommodate the addition of step frame members **56** for added steps. A handrail assembly may be provided on each side of the step assembly to provide easy and secure climbing of the steps.

[0056] As shown in FIG. 11, the handrail system may include a first tubular upper handrail member **72** having an open end for receiving the swedged (reduced diameter) end **76** of an additional handrail segment **74**. An additional support leg **78**, baluster segment **80**, and plastic end plug **82** may be provided to complete the handrail extension in refined fashion. The additional support leg may be attached to the first handrail member **72** or to the an additional handrail segment **74** as needed to provide a lower support for the handrail assembly on the step assembly.

[0057] While the present invention has been particularly shown and described with reference to an embodiment thereof, it will be understood by those skilled in the art that various changes in form and detail may be made without departing from the spirit and scope of the present invention.

I claim:

1. A modular porch apparatus comprising:

a main deck frame constructed of a plurality of support members having connecting end members, including swedged end members having reduced circumference and female receiving end members arranged to receive the swedged end members for interconnecting said support members;

vertically adjustable legs attached to the main deck frame and extending downwardly;

a decking material secured on the main deck frame providing a flat horizontal deck surface;

a railing assembly attached to said deck surface;

said railing assembly including at least two vertically oriented elongate lower members;

said lower members each including a first connecting end;

said lower members supporting a lower horizontal rail having a plurality of apertures along its span;

a plurality of balusters inserted into the apertures of said lower horizontal rail;

an upper horizontal handrail including second connecting ends;

either said first connecting ends or second connecting ends being swedged and of reduced circumference;

said vertically oriented lower members connected to said upper horizontal handrail by insertion of the first con-

necting end of the lower members into the second connecting ends of the upper handrail; and,

said upper horizontal handrail further including a plurality of apertures along its span that receive said balusters and lock said balusters into place with the connection of the upper horizontal handrail to the lower members.

2. A modular porch apparatus comprising:

a pair of elongate peripheral C-shape support members, each C-shape support member having an axially aligned receiving end and two perpendicular disposed receiving ends;

a pair of elongate peripheral L-shape support members, each L-shape support member having a perpendicular disposed receiving end and an axially aligned receiving end;

a pair of elongate peripheral third support members, each third support member having two axially aligned receiving ends thereon and a perpendicularly disposed receiving end centrally located on each of the third pair of support members;

an elongate interior T-shape support member having axially aligned receiving ends and perpendicular receiving ends centrally located on the T-shape member and extending outwardly to form a T-shape;

a pair of elongate interior fifth support members that are substantially straight, each fifth support member having axially aligned receiving ends;

said C-shape support members, L-shape support members, third support members, interior T-shape support member, and interior fifth support members connected to form a rectangular main deck frame;

vertically adjustable legs attached to the main deck frame and extending downwardly; and

a decking material attached to the main deck frame to form a deck surface.

3. A modular porch apparatus as in claim 2 including:

a step assembly attached to said main deck frame;

said step assembly having at least two connected step frame members;

each step frame member including a vertically disposed top member, a horizontally disposed center step support member connected to the top member, and a vertically disposed lower member connected to the center step support member;

said vertically disposed lower member having a tubular section for receiving the top member of an additional step frame member or a telescoping leg member; and

a step decking material attached to the center step support member of each step frame member.

4. A modular porch apparatus as in claim 3 including an adjustable handrail assembly attached to said step assembly said handrail assembly including:

a first handrail member;

a first handrail segment;

said first handrail member having an open end for receiving said handrail segment, and said handrail segment

having a swedged end of reduced circumference for insertion into said open end for connection of the first handrail segment to the first handrail member, and said handrail segment having an open end for receiving an additional handrail segment; and

a support leg attached to said first handrail member, first handrail segment, or additional handrail segment.

5. A modular step assembly comprising:

at least two modularly connected step frame members;

each step frame member including a vertically disposed top member, a horizontally disposed center step support member connected to the top member, and a vertically disposed lower member connected to the center step support member;

said vertically disposed lower member having a tubular section for receiving a top member of an additional step frame member or a telescoping leg member; and

a step decking material attached to the center step support member of each step frame member.

6. A modular handrail assembly comprising:

a first handrail member;

a first handrail segment;

said first handrail member having an open end for receiving said handrail segment, and said handrail segment having a swedged end of reduced circumference for insertion into said open end for connection of the first handrail segment to the first handrail member, and said handrail segment having an open end for receiving an additional handrail segment; and

a support leg attached to said first handrail member, first handrail segment, or additional handrail segment.

7. A combination modular step assembly and modular handrail assembly comprising:

at least two modularly connected step frame members;

each step frame member including a vertically disposed top member, a horizontally disposed center step support member connected to the top member, and a vertically disposed lower member connected to the center step support member;

said vertically disposed lower member having a tubular section for receiving a top member of an additional step frame member or a telescoping leg member;

a step decking material attached to the center step support member of each step frame member;

a first handrail member having a first support leg for supporting and attaching the first handrail member to the step assembly;

a first handrail segment;

said first handrail member having an open end for receiving said handrail segment, and said handrail segment having a swedged end of reduced circumference for insertion into said open end for connection of the first handrail segment to the first handrail member, and said

handrail segment having an open end for receiving an additional handrail segment; and

a support leg attached to said first handrail member, first handrail segment, or additional handrail segment and

supporting said handrail assembly on the step assembly.

* * * * *