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3,017,970

BUILDING CONSTRUCTION SYSTEM

Filed Oct. 9, 1957

2 Sheets-Sheet 1

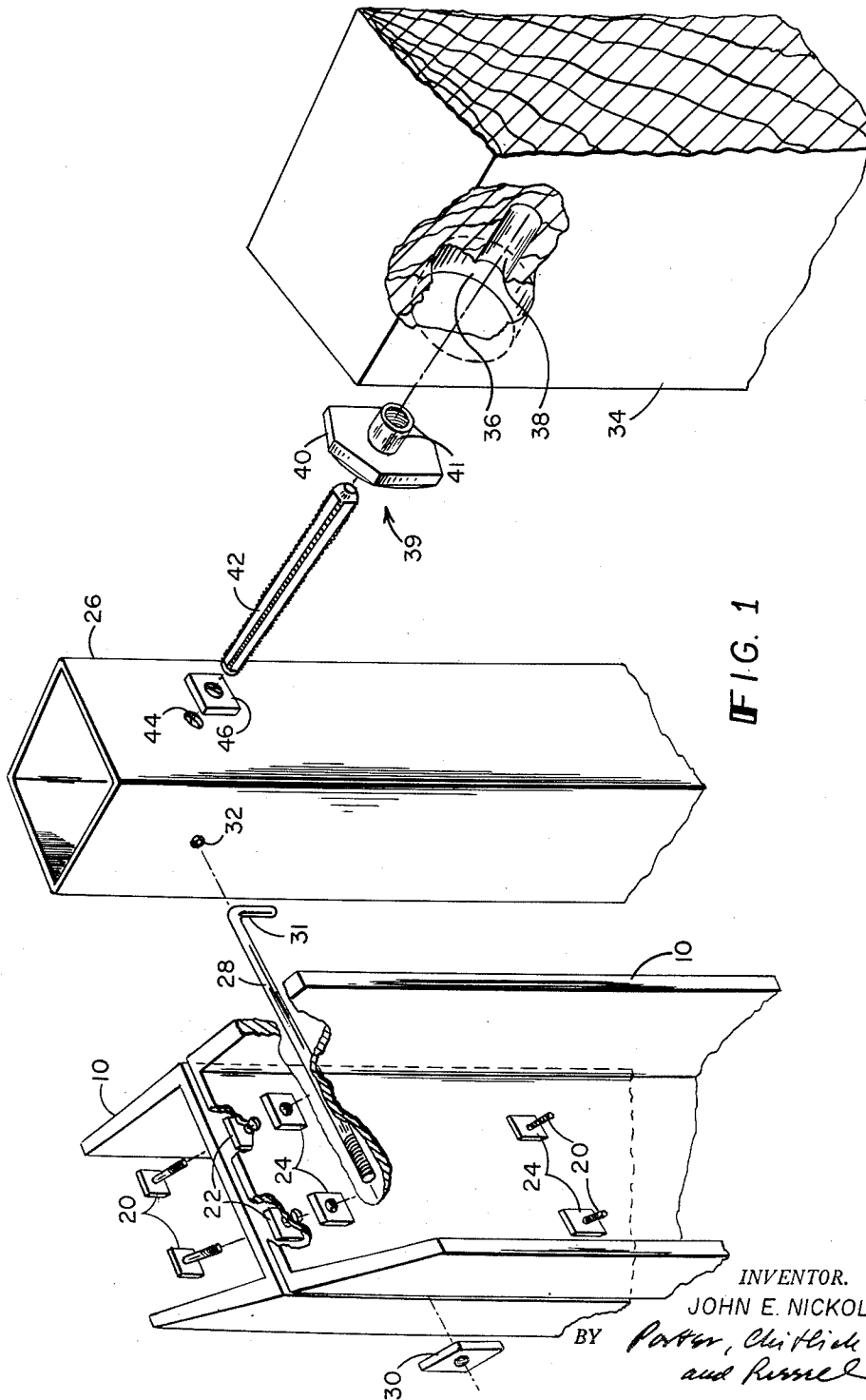


FIG. 1

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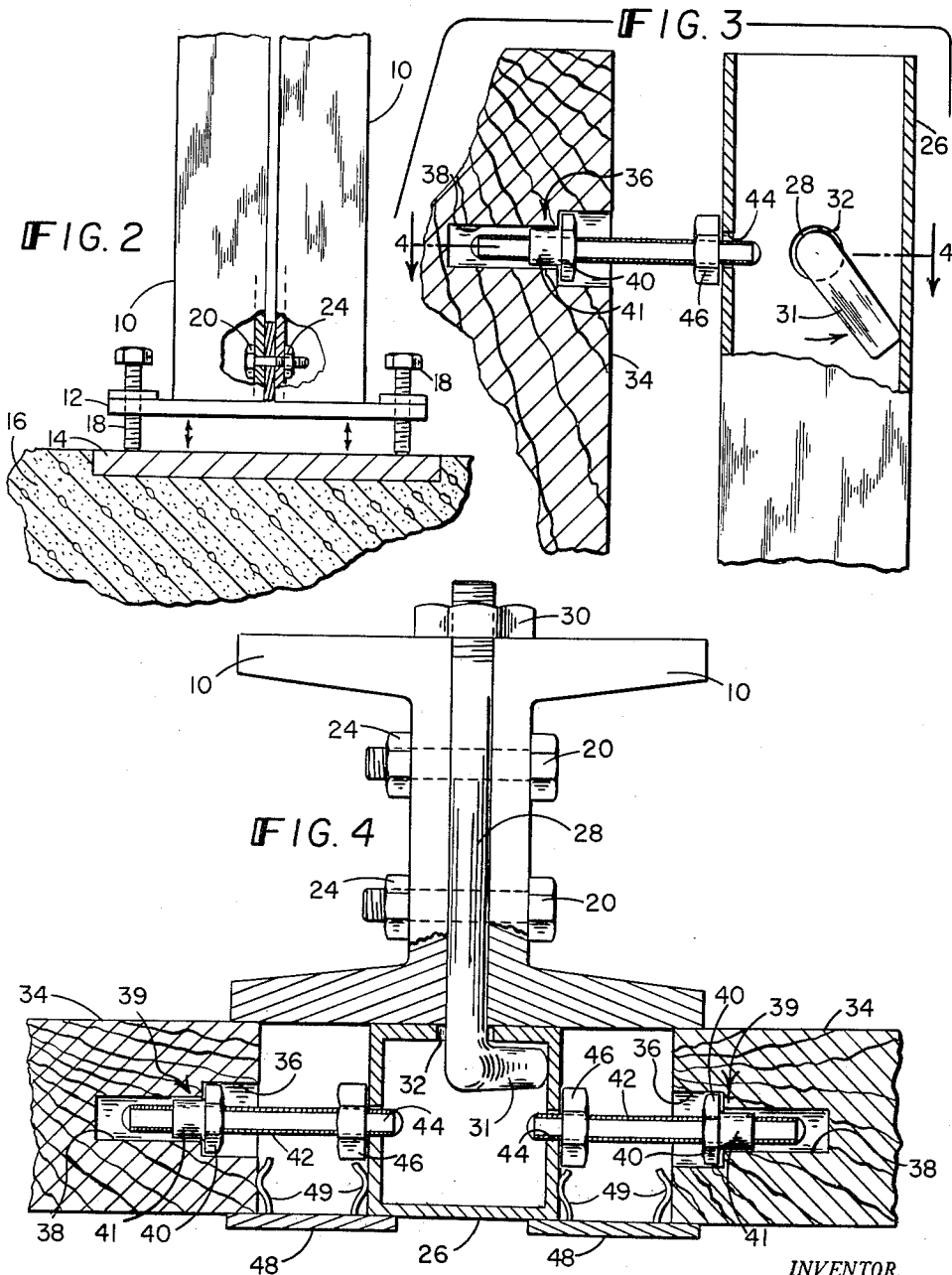
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BUILDING CONSTRUCTION SYSTEM

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1 Claim. (Cl. 189—34)

This invention relates to building construction, and more particularly to support mechanisms for wall panels.

In the past, a disadvantage of conventional panel support mechanisms has been their lack of simplicity. This has been due to the difficulties associated with the use of prefabricated panels, which must be fitted, ordinarily, in accordance with close tolerances. The difficulties of adjustment to fit these tolerances have led to the use of complicated mechanisms. Therefore, it is an object of my invention to provide for a simple means of wall panel erection, involving only the turning of a few nuts.

Another and related disadvantage of conventional mechanisms has been the high cost involved in the time necessary to erect a complicated panel, and the high costs of the skilled labor needed to perform the work. Accordingly, another object of my invention is to provide an apparatus which can be erected at low cost in terms both of time and of labor.

A further disadvantage in the past has been that the support mechanisms have been visible when erected, leaving unsightly mechanical devices exposed to view. Thus, it is another object of my invention to provide for a smooth finished appearance on the wall panel and its supports when they are assembled, without any protruding mechanisms.

In the accomplishment of these and other objects of my invention in a preferred embodiment thereof, I employ a wall panel erected between parallel spaced vertical supporting posts, which in turn are fastened to an outer framework. The outer framework is composed of steel columns and is adjustable so that the panel supporting posts will be in the correct position for receiving the wall panel. The wall panel is fitted between the supporting posts and is held in place, under compression from its edges, by pins extending into the edge of the wall panel and into adjacent holes in the supporting posts. These pins are threaded, and carry nuts bearing against the post and the panel, thus exerting forces on each end of the panel and holding it compressed and in place. A trimming strip is placed over the open space between the panel and the post, providing the smooth exterior finish desired.

A feature of my invention is the use of fastening means that are entirely contained within the wall panel before it is put into place. The pins and nuts lie in recesses in the panel edge with the pin protruding slightly. The only tool needed for fastening the panel to its supporting posts is a wrench which will fit in the open space between the panel and the post and can be used to turn the pin so as to draw it out from its recess and then to tighten the nuts. This interior fastening means being wholly within the wall then permits the use of a simple trimming strip covering the space between wall panel and supporting post.

A further feature of my invention is the adjustable character of the fastening apparatus, so that small variations in the distance between the panel supporting posts do not affect the mechanical effectiveness or finished appearance of the mounting.

An additional feature is the adaptability of my invention to the construction of various types of buildings. Within limits imposed by the size of the prefabricated panels, any arrangement of rooms is possible. Further, the panels can be made of solid wood, wood with windows of various sizes built in, or plate glass with a narrow wooden frame.

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These and other objects and features of the invention will best be understood and appreciated from the following description of a preferred embodiment thereof, selected for purposes of illustration and shown in the accompanying drawings in which:

FIG. 1 is a view in perspective of the individual component parts of the outer framework, panel supporting posts, wall panel and associated devices, showing certain portions in partial cross section and other portions in exploded relation;

FIG. 2 is a view in partial cross section of the columns forming the outer framework and their support plates;

FIG. 3 is a view in cross section of one end of a wall panel fitted to a supporting post; and

FIG. 4 is a sectional view along the lines 4—4 of FIG. 3.

In a preferred embodiment of my invention, the outer framework is composed of two U-shaped steel columns 10 which are fastened back to back with approximately a 1/2" space between them. As may be seen in FIG. 2, these columns are attached at their base to a plate 12 which interposes a vertical leaf between them, maintaining the 1/2" space. This plate 12 is in turn mounted upon a flat steel plate 14 which rests upon the ground 16 or foundation for the structure. The plate 12 is held above plate 14 by bolts 18 which allow plate 12 and the column 10 to be raised or lowered as desired. The columns 10 are fastened together at intervals along their length by bolts 20 and nuts 22 and 24. The nuts 22 are inserted between the columns 10 to maintain the 1/2" spacing. The panel supporting post 26 is fastened to the U-shaped columns 10 by means of L-shaped hooks 28 threaded at one end to receive nuts 30 and being provided at the other end with a hook segment 31. The hook segments 31 are inserted into holes 32 in the posts 26. It should be noted that these hook segments 31 are slightly longer than one half the width of the panel supporting post 26 so that they cannot turn inside the post 26 when the nuts 30 are tightened to secure the post 26 to the columns 10.

The wall panel 34 has a series of three or four recesses 36 spaced at equal intervals along its vertical edges. Each recess 36 is provided with a smaller and concentric recess 38 extending to a greater depth into the panel 34. Lodged in each of these recesses 36 is a T-nut 39 having a laterally extending flange 40 resting on the inner edges of the recess 36. The T-nut 39 also has a central or body portion 41 seated within the inner recess 38. The T-nuts 39 receive threaded metal pins 42 each of which is provided with flat sides to facilitate turning the same with a wrench. The panel supporting post 26 has holes 44 situated adjacent to the recesses 36 in the panel 34, and the pins 42 extend into these holes 44. The pins 42 are held in place by nuts 46, and the combined forces of the nuts 40 and 46 on the pins 42 at both edges of the wall panel 34 hold the panel under compression. A trimming strip 48 is placed over the open space 50 between the panel 34 and the support post 26 and is held in place by spring clips 49.

It will now be seen that the operation of my invention is as follows. The plates 12 are bolted to plates 14 and the outer framework is erected by bolting the U-shaped columns 10 to the plates 12 in a vertical parallel-spaced relationship. Suitable cross members may be used to complete the outer framework. After the columns 10 are erected, their position may be adjusted vertically by changing the space between plates 12 and 14. These adjustments will help to insure that the panel supporting posts 26 are properly positioned for receiving the wall panels 34.

The next operation is to fasten the panel supporting posts 26 to the columns 10. This is accomplished by

holding the post 26 up to the columns 10, then inserting the hooks 28 into the space between the columns 10 and inserting the hook segments 31 into the holes 32 in the post 26. The longer segments of the hooks 28 are then pulled perpendicular to the surface of the post 26 so that the threaded portion of the hook 28 extends out beyond the edge of the columns 10. The post 26 is fastened securely against the columns 10 by tightening the nuts 30 on the threaded portion of the hooks 28.

The threaded pins 42, the T-nuts 40, and the nuts 46 are all prefabricated into the wall panel 34 before it is put in place the T-nut 40 is seated as described above, and the pin 42 extends far enough into the inner recess 38 so that only a short length of the pin 42 protrudes from the edge of the panel 34. The nut 46, mounted on the pin 42, is concealed within the larger recess 36.

The erection of the wall panel 34 is accomplished by putting it up between two panel supporting posts 26 so that the recesses 36 are substantially adjacent to the holes 44 in the posts 26. The only tool then needed to complete the operation is a wrench which can be inserted in the spaces 50 between the panel 34 and the posts 26 and used to turn the pins 42 so that they come out of the recesses 38 in the panel 34 and enter the adjacent holes 44 in the posts 26. The holes 44 can be made sufficiently large so that small variations in the placement of the panel 34 or the posts 26 will not affect the ability of the pins 42 to enter the holes 44. The manufacture of the posts 26 and the panels 34 is planned to keep all parts interchangeable. The spacing of the recesses 36 on the panels 34 and the spacing of the holes 44 in the posts 26 is standardized, so that any panel 34 can be fitted to any post 26.

The panel is made fast by turning the nuts 46, at both ends of the wall panel 34, which have been drawn out of recesses 36 by the turning of the pins 42. These nuts 46 are tightened against the posts 26 at both ends of the panel 34, using a wrench inserted in the spaces 50.

Final finishing may be accomplished by packing the open spaces 50 with sponge rubber, felt, asbestos, fiberglass, or other suitable insulating material, and by putting the trimming strip 48 in place over the space 50.

Certain minor variations of this preferred embodiment will be apparent to those skilled in the art, and therefore, it is not my intention to confine the invention to the precise form herein shown, but rather to limit it in terms of the appended claims.

Having thus described and disclosed a preferred embodiment of my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

Apparatus for supporting and anchoring building wall panels comprising a generally rectilinear building frame including vertical members, said vertical members being composed of U-shaped metal beams and means for fastening said beams in a back to back position with approximately a 1/4" to 1" space between them, said means being bolts and nuts; wall panel supporting posts, said posts

being vertical hollow metal posts, walls forming first holes in the side of said panel supporting posts adjacent to said frame, means for fastening said supporting posts to said vertical building frame members, said latter means consisting of fastening pins having leg segments and foot segments, said leg segments having a threaded portion at one end, a middle portion passing through the open space in the vertical building frame members, and a portion at the other end passing through holes in one side of the panel supporting posts, said foot segments being inside said panel supporting posts, said foot segments being sufficiently long so as to be unable to make a complete revolution inside the panel supporting post; nuts on said threaded end portion of said leg segment; wall panels located between said panel supporting posts, said wall panels having horizontal and vertical edges, said supporting posts being closely adjacent to said wall panel vertical edges; walls forming holes in said wall panel vertical edges, said holes consisting of two sections, a first, adjacent to the wall panel edge, with a larger perimeter, and a second coaxial with the first extending further inside said wall panel with a smaller perimeter; walls forming second holes in the side of said panel supporting post adjacent to said wall panel vertical edge, said second holes being adjacent to and in alignment with said holes in said wall panel; threaded metal pins having flat sides to accommodate a wrench located between and extending into said second supporting post holes and said wall panel holes, said pins extending through said first section of said wall panel hole and into said second section of said wall panel hole, means associated with said threaded pins for holding said wall panel in place under compression between said panel supporting posts, said means consisting of first nuts threadably affixed to said metal pin and adjacent to said panel supporting posts, and second nuts threadably affixed to said metal pin, said second nuts having two sections a first lying within said first section of said wall panel hole and a second coaxial with the first lying within said second section of said wall panel hole.

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