April 20, 1965 L. E. TASSELL 3,179,257

DEMOUNTABLE POST AND PANEL AND SHELF SUPPORTING CONNECTIONS

Filed Nov. 4, 1963 2 Sheets-Sheet 1

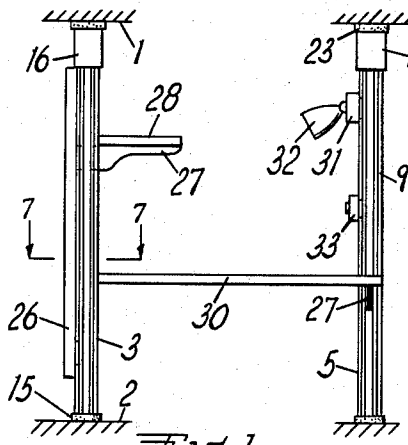


Fig. 1

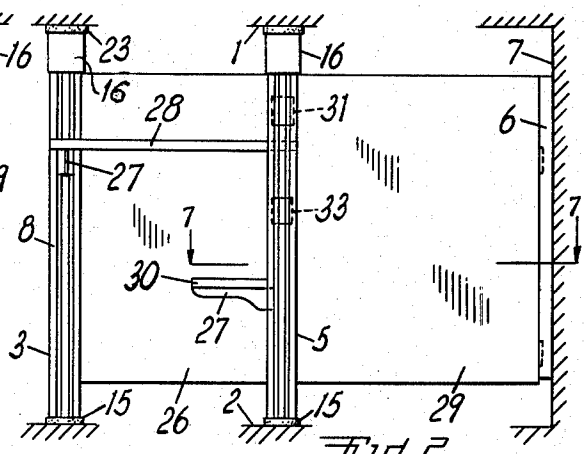


Fig. 2

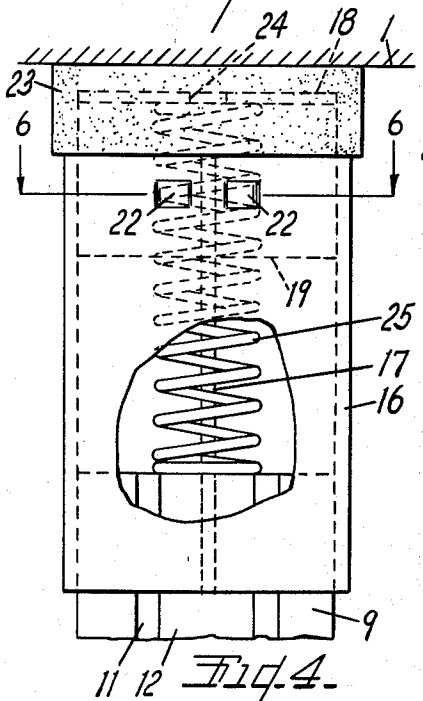


Fig. 4

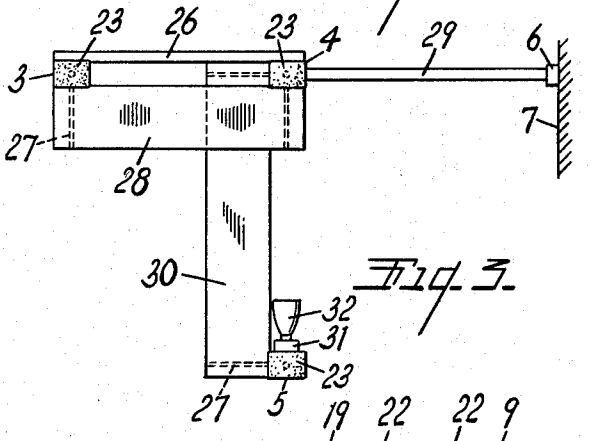


Fig. 3

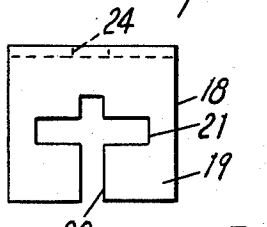


Fig. 5

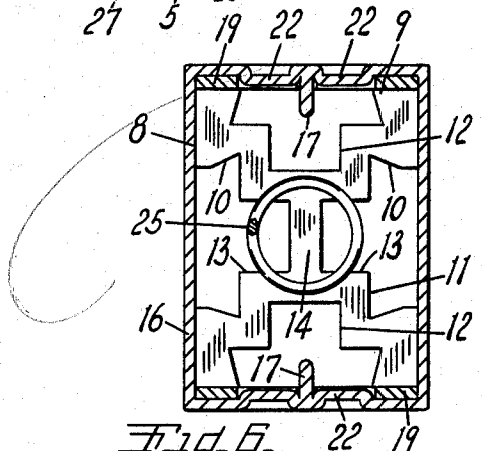


Fig. 6

INVENTOR.
Leslie E. Tassell
BY
ATTORNEY

April 20, 1965 L. E. TASSELL 3,179,257

DEMOUNTABLE POST AND PANEL AND SHELF SUPPORTING CONNECTIONS

Filed Nov. 4, 1963 2 Sheets-Sheet 2

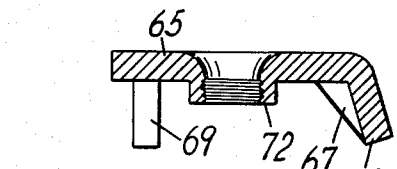


Fig. 14.

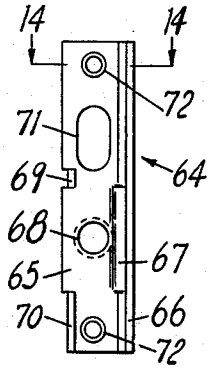


Fig. 12.

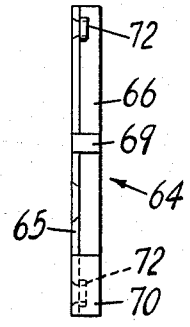


Fig. 13.

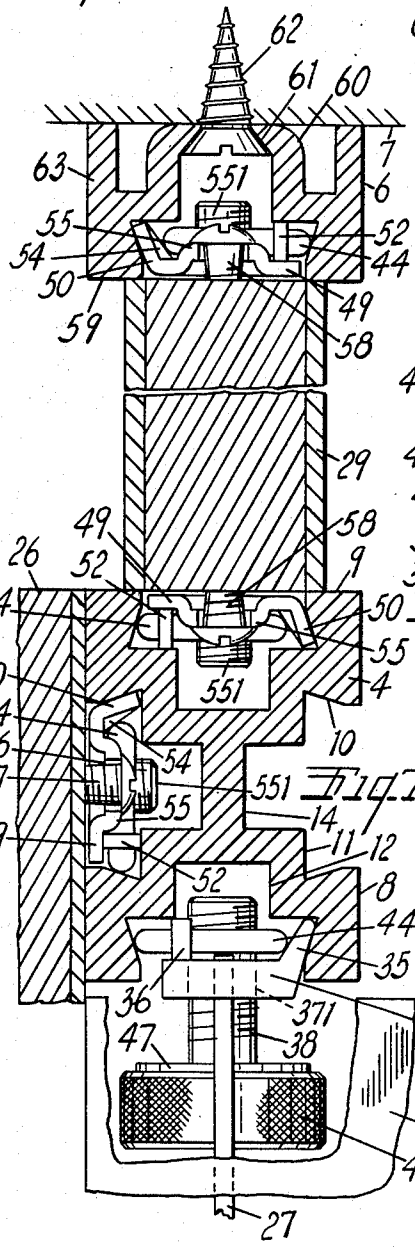


Fig. 7.

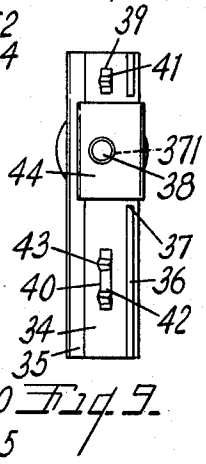


Fig. 9.

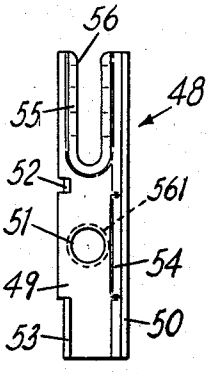


Fig. 10.

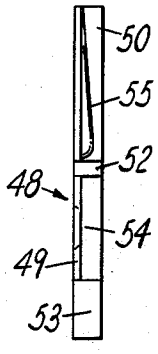


Fig. 11.

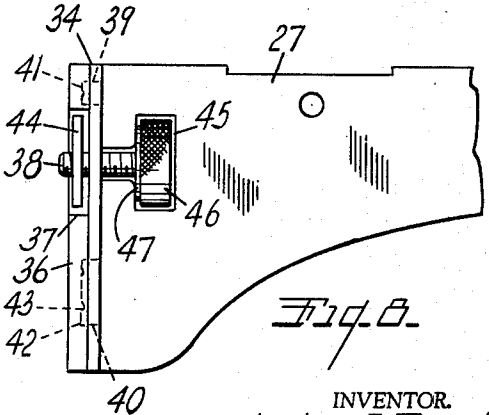


Fig. 8.

INVENTOR.
Leslie E. Tassell
BY
ATTORNEY

United States Patent Office 3,179,257 Patented Apr. 20, 1965

3,179,257

DEMOUNTABLE POST AND PANEL AND SHELF SUPPORTING CONNECTIONS

Leslie Ernest Tassell, Grand Rapids, Mich., assignor to Tassell Hardware Company, Grand Rapids, Mich.

Filed Nov. 4, 1963, Ser. No. 321,305
18 Claims. (Cl. 211—148)

This invention relates to improvements in demountable post and panel and shelf supporting connections therefor. The principal objects of this invention are:

First, to provide a novel form of post which may be formed by extrusion for mounting between the floor and ceiling of a room to support panels and shelves in various relations within the room and which will provide a novel and extremely rigid supporting connection between the post and the panels and shelves.

Second, to provide a novel form of yieldable cap assembly for a post for pressing the lower end of the post against the floor and yieldably engaging the upper end of the post with the ceiling in which the yieldable connection to the post is easily assembled and inexpensive to manufacture.

Third, to provide a novel cross sectional shape for a post for mounting between the floor and ceiling of a room with novel slots in the sides of the post for receiving laterally projecting shelf supporting brackets with a novel and rigid releasable clamping engagement with the post.

Fourth, to provide a novel cross sectional shape for a panel supporting post with slots in the sides of the post cooperative with novel anchoring clips which rigidly but adjustably connect the panels to the sides of the post at various desired positions.

Fifth, to provide a novel slotted post and coacting anchoring clip connection for securely mounting various objects and fixtures at any position on the sides of the post.

Other objects and advantages of the invention will be apparent from a consideration of the following description and claims. The drawings, of which there are two sheets, illustrate a highly practical form of the post and the several mounting connections between the post and supported panels and brackets and the yieldable connection between the top of the post and the ceiling of a room.

FIG. 1 is a fragmentary end elevational view of an assembly of several posts embodying the invention with various shelves, brackets, panels, and fixtures mounted in a room, the ceiling and floor of the room being illustrated in cross section.

FIG. 2 is a side elevational view of the assembly shown in FIG. 1.

FIG. 3 is a top plan view of the posts and panels of the assembly shown in FIGURES 1 and 2.

FIG. 4 is an enlarged fragmentary side elevational view of one of the posts of the assembly and the yieldable connection between the top of the post and the ceiling of a room.

FIG. 5 is a side elevational view of an inner part of the yieldable connection at the top of the post.

FIG. 6 is a transverse cross sectional view taken along the plane of the line 6—6 in FIG. 4 and showing the details of the connection between the post and the yieldably supported cap on the upper end thereof.

FIG. 7 is an enlarged fragmentary cross sectional view taken along the plane of the lines 7—7 in FIGS. 1 and 2 and illustrating the cross sectional shape of the post and the connections of the shelf supporting brackets and the panel connecting clips thereto.

FIG. 8 is a fragmentary side elevational view of the shelf supporting bracket shown in FIG. 7 disassembled from the post and viewed from the left side of FIG. 7.

FIG. 9 is an inside or left elevational view of the shelf supporting bracket and connecting clamp shown in FIG. 8.

FIG. 10 is a back or inside elevational view of the panel supporting clip and clamp shown in FIG. 7.

FIG. 11 is a side elevational view of the clip shown in FIG. 10.

FIG. 12 is a back or inside elevational view of a modified form of bracket engaging clamp for supporting a variety of fixtures or objects on the post.

FIG. 13 is a side elevational view of the clip shown in FIG. 12.

FIG. 14 is an enlarged cross sectional view taken along the plane of the line 14—14 in FIG. 12.

The post and panel assembly shown in FIGURES 1, 2 and 3 illustrates the ceiling of a room at 1 and the floor of the room at 2. Three posts embodying the invention are illustrated generally at 3, 4 and 5. A half post section is shown at 6 where it is possible or desirable to connect one side of a panel to a side wall 7 of the room. As appears more clearly in FIGURES 4 and 6 the posts 3, 4 and 5 which are all of identical cross section are of oblong rectangular outline with parallel side walls 8 and parallel end walls 9. Each of the walls defines a central dove-tail slot with inwardly divergent side edges 10 and the slots and walls 10 are of equal size and shape on all sides of the post. Inwardly from the divergent walls 10 are inner vertical surfaces 11 extending laterally to a central recess 12 and 13 which project inwardly of the cross section of the post. Since the side walls 8 are wider than the side walls 9, there is a transverse vertical connecting web 14 between the two ends of the post cross section which forms the base of the recesses 13 at the inner sides of the side walls of the post. The cross section of the post as described is well adapted to be extruded as a continuous extrusion process to form posts of uniform shape and variable lengths.

The lower ends of the several posts are provided with cupped rubber shoes or pads 15 which rest upon the floor and at their upper ends the posts are provided with tubular rectangular sleeves 16 which fit slidably and closely telescopically over the ends of the posts. Inwardly projecting ribs 17 on the narrower or end sides of the sleeves project into the slots in the narrow or end sides of the posts.

Positioned fixedly within the upper ends of the sleeves 16 is a cap element 18 shown in elevation in FIG. 5. The cap is of downwardly opening U-shaped cross section having side walls 19 that fit telescopically within the upper end of the sleeve 16 and which are provided with cross-shaped slots 20 opening to the lower edges of the side flanges 19. The laterally projecting arms 21 of the slots 20 are spaced below the top of the cap 18 and permit the cap to be secured to the upper end of the sleeve by rolling or deforming the sides of the sleeve into the lateral branches 21 as at 22 in FIG. 6 on opposite sides of the rib 17 in the sleeve. The cap is thus permanently and easily connected to the upper end of the sleeve and projects slightly above the upper end of the sleeve. A rubber or other cushioning cover 23 is fitted over the cap member 18 and downwardly to the end of the sleeve. The top wall or cross piece of the cap 18 is provided with a central hole or opening as at 24 in FIG. 5 so that the cap member and the sleeve 16 may be permanently secured to the ceiling of a room if a permanent installation is desired. In this case the rubber cover 23 might be omitted but the usual form of installation is as shown in which a coil spring 25 is positioned within the sleeve 16 with its lower end abutting against the upper end of the post cross section and with its upper end abutting yieldably against the top wall of the cover member 18 within the sleeve.

In the particular assembly of posts, panels, shelves and fixtures illustrated the posts 3 and 4 support a vertical partition panel 26 across their broader or wider sides and also support shelf supporting brackets 27 on their opposite broader sides for supporting a first shelf 28. A second partition or panel 29 is supported between the narrow side edge of the post 4 and the half post section 6 secured to the wall. The posts 4 and 5 support other shelf supporting brackets 27 which are connected to the narrow side edges of the post to support a second and lower shelf or desk panel 30. The wider side of the post 5 supports a mounting fixture box 31 having a lamp shade 32 connected thereto and a switch box 33 is mounted on the same broad side of the post 5 to illustrate various positions in which the panels, brackets and fixtures can be mounted on the posts.

As appears more clearly in FIGS. 7, 8 and 9 the shelf supporting brackets 27 are relatively thin metal plates connected at their inner ends to relatively thick mounting and clamping plates 34 which are conveniently formed as extrusions and cut to the desired length. The plates 34 have rearwardly or inwardly projecting angled flanges 35 on one side edge with the outer surface of the flange disposed at the same angle as the inner face 10 of the slots in the post. On its opposite edge the plate 34 has an inwardly projecting vertical flange 36 which is cut away between its ends as at 37 for a purpose to be described. Between the flanges 35 and 36 the plate 34 is provided with a central hole 371 through which a clamp screw 38 is extended in freely rotatable relation. The plate also defines an upper slot 39 and a lower slot 40 through which tongues 41 and 42 respectively formed on the inner end of the bracket plate 27 are projected. The lower tongue 42 is staked or deformed laterally as at 43 on the inner side of the clamping plate as appears most clearly in FIG. 9 to permanently and securely connect the bracket plate to the clamping plate while the tongues 41 and 42 prevent lateral deflection of the bracket plate relative to the clamping plate.

The relatively thick angled flange 35 is disposed laterally with respect to the hole 371 and the slots 39 and 40 so that the bracket plate 27 is positioned in the center of the slot in the side of the post when the clamping plate and the angled flange 35 are moved into abutting engagement with one inside surface 10 of the slot in the post. The inner end of the bolt 38 is threadedly engaged with a rectangular nut 44 and the hole in the nut receiving the bolt is off center so that the longer end of the nut projects through the notch 37 formed in the flanges 36 when the shorter end engages the inner side of the angled flange 35. With reference to FIG. 7 it will be noted that the ends of the flanges 36 and the edges of the notch 37 engage and prevent rotation of the nut 44 so that rotation of the bolt 38 causes the nut to be drawn outwardly into clamping engagement with one side 10 of the slot in the post and with the inner inclined side of the angled flange 35. This causes the clamping plate to be urged both laterally and outwardly of the slot in the side of the post and securely gripped in the slot in the post. The inner end of the shelf supporting bracket plate 27 defines a T-shaped slot 45 with the head 46 of the bolt 38 disposed within the cross portion of the T-slot and the shank of the bolt projecting freely through the base of the T-slot to the hole 371. A washer 47 positioned underneath the head 46 bears against the inner end of the T-slot and forms the reaction abutment for the clamping force applied by the bolt and the nut 44. The elongated and relatively thick nature of the clamping plate 34 assures rigid connection between the bracket plate and the post with the plate projecting perpendicularly from the side of the post. When one of the shelves 28 or 30 is connected across two of these bracket plates the assembly is further rigidified by mutual support and connection between the two brackets and the shelf.

The panels 26 and 29 are secured to the posts by clips shown most clearly in FIGS. 7, 10 and 11. The clips indicated generally at 48 are desirably made as stampings having a flat central body 49 with a rearwardly or inwardly projecting angled flange 50 on one side and a screw hole 51 formed in the lower portion of the body 49. Spaced flanges 52 and 53 are turned perpendicularly rearwardly on opposite sides of the screw hole and the angled flange 50 is rearwardly and inwardly offset at 54 to strengthen the clip in the area of the screw hole. Above the screw hole 51 the central body 49 is rearwardly or inwardly offset in an inclined plane as at 55 and the inclined surface is slotted vertically from the top as at 56. The clips are attached to selected positions in one of the slotted sides of the posts by means of flat headed screws 551 which have their heads received in countersunk recesses 561 around the outsides of the holes 51. The threaded shanks of the screws engage rectangular nuts 44 which are the same as the nuts received on the bolts 38 mounting the shelf brackets.

The clips 48 are positioned within one of the slots of the post or posts at desired positions with the inclined flange 50 bearing against the inner beveled surface 10 on one side of the slot and with the rearwardly turned flanges 52 and 53 seating against the bottom surface 11 of the slot on the opposite side of the recess 12 or 13 at the bottom of the slot depending upon the side of the post to which the clip is applied. The rectangular nut 44 with its off center screw receiving hole is drawn outwardly to engage its longer end with the beveled surface of the post and to engage its shorter end with the inside of the inclined flange 50 at the inwardly offset portion 54 of the flange. The offset portion 54 thus compensates for the difference in thickness between the stamped flange 50 on the clips 48 and the thicker flange 35 on the extruded clamp plates 34. The downwardly and inwardly inclined slots 56 cammingly engage screws mounted in the panels to be supported by the clips.

The panel 26 which extends across the face of two adjacent posts has screws 57 engaged with its rear side to enter into the upper ends of the slots 56 in the supporting clips and be cammed inwardly as the panel is slipped downwardly to draw the panel tight against the side faces of the posts. The panel 29 has screws 58 which are engaged in the edges of the panel and similarly received in the upper ends of the slots 56 of the supporting clips and drawn inwardly to abut the edges of the panel against the side faces of the posts. Desirably the panels are thicker than the width of the slots in the post to fully cover the slots.

The half post section 6 shown in FIGS. 2, 3 and 7 is formed with a front wall 59 having a slot therein shaped to the same size and contour as the slots in the posts 3, 4 and 5 with inwardly divergent inner faces 10 merging with spaced flat back surfaces 11. An outwardly opening U-shaped core 60 has its inner wall provided with countersunk holes 61 at intervals therealong to receive screws 62 or other fasteners for securing the half post to a room wall. Side walls 63 on the post section extend rearwardly from the front face 59 to abut against the wall of the room.

The fixture attaching clips for mounting the fixtures such as the lamp base 31 and the switch box 33 are indicated generally at 64 in FIGS. 12 and 13. The clips are similar to the panel mounting clips 48 in that they are formed as sheet metal stampings with flat central bodies 65 having rearwardly inclined flanges 66 on one side with a portion of the flange inwardly offset as at 67 opposite a countersunk hole 68. The opposite sides of the body portions 65 have rearwardly turned perpendicular flanges 69 and 70 positioned in spaced relation on opposite sides of the hole 68 to guidingly retain one of the nuts 44. The flat body 65 of the clip defines an elongated slot 71 through which an electrical wire may be extended and at its upper and lower ends is provided with rearwardly or inwardly extruded bosses which are

internally threaded to receive mounting or connecting screws for connecting fixtures such as the lamp base 31 or the switch box 33 to the clips. The threaded bosses 72 are spaced longitudinally along the clips by a distance corresponding to the standardized spacing of electrical fixtures of the type to be mounted on the clips.

It will be appreciated that the various elements of the post panel and shelf and fixture assembly can be arranged in a wide variety of positions and arrangements and that variations in the details of the post structure and the clamping plates and connecting clips can be made without departing from the theory of the invention as defined in the attached claims.

What is claimed as new is:

1. In a supporting post, panel, shelf bracket and fixture assembly and connecting means therebetween,

a post of extruded uniform cross section from end to end having parallel longer sides connected by parallel shorter sides,

slots of equal width formed centrally in each of said sides with inwardly divergent sides merging with spaced coplanar inner surfaces on opposite sides of an inner recess,

a central web connecting the bases of the recesses in the shorter sides of the post and forming the bottom of the recesses, in the wider sides of the post,

a shelf bracket clamp plate of extruded cross section having a flat outer base with an inwardly inclined flange disposed at the same angle as the divergent angle in said slots,

said plate being narrower than said slots and having rearwardly turned flanges on its opposite edge from said inclined flange,

a bolt receiving opening formed through the front portion of said plate and offset upwardly from the center thereof and between a gap formed between said rearwardly turned flanges,

slots formed through said plate above and below said bolt receiving hole,

a flat shelf supporting bracket abutted endwise against said plate and having tongues extending through said slots,

at least one of said tongues being staked on its rear side over the back side of said plate,

a T-shaped slot formed in the end of said shelf supporting bracket with the base of the T opposed to said hole in said plate,

a clamp bolt having a knurled head positioned in the cross section of said T slot with its shank projecting through the base of the slot and the hole in said plate,

a rectangular nut having an offset hole therein threadedly engaged with the shank of said bolt with the longer end of the nut projecting between the rearwardly turned flanges on said plate into clamping engagement with one of the divergent sides of one of the slots in said post and with the shorter side of the nut bearing against the inner face of the inclined flange on said plate,

a washer positioned around the shank of said bolt and between the head of the bolt and the edge of the cross portion of said T-shaped slot,

a panel attaching clip of stamped sheet metal having a central body portion with a rearwardly inclined flange on one edge disposed at the same angle as the divergent inner surface of said slots in said post and with spaced rearwardly turned perpendicular flanges on the opposite side of the body,

a screw receiving hole formed in said central body portion between said rearwardly turned perpendicular flanges,

a screw having its head countersunk into the outer side of said clip body and passing through the hole therein,

a rectangular nut having an offset hole formed therein and threadingly receiving the shank of said screw with the shorter end of the nut engaging the inner side of the inclined flange on said body and with the longer end of the nut engaging the opposite beveled edge of the slot in the post,

the inclined flange of said clip being inwardly offset opposite said shorter end of said nut,

the upper portion of the central body of said clip being inwardly inclined from the top downwardly and defining an upwardly opening cam slot above said screw adapted to cammingly receive the head of a screw mounted in a panel to be supported from the clip,

a fixture supporting clip formed as a sheet metal stamping with a flat central body having an angled flange turned rearwardly along one edge at an angle corresponding to the beveled inner surfaces of the slots in said post and having spaced rearwardly turned flanges on its opposite edge,

a counter sunk screw receiving hole formed through the flat body of the fixture supporting clip between said spaced flanges,

a screw having its head received in said hole and engaging a rectangular nut having an offset hole therein with the shorter end of the nut engaged with the inner side of said angled flange and the longer end of the nut engaged with the inclined face on the opposite side of the slot in the post,

the angled flange on said fixture attaching clip being rearwardly and inwardly offset opposite said nut,

an opening formed through said flat body of said fixture supporting clip in spaced relation to said screw receiving hole,

and inwardly extruded bosses formed in the ends of the body of said fixture supporting clip and internally threaded to receive mounting screws for connecting fixture supports thereto.

2. In a supporting post, panel, shelf bracket and fixture assembly and connecting means therebetween,

a post of extruded uniform cross section from end to end having parallel longer sides connected by parallel shorter sides,

slots of equal width formed centrally in each of said sides with inwardly divergent sides merging with spaced coplanar inner surfaces on opposite sides of an inner recess,

a central web connecting the bases of the recesses in the shorter sides of the post and forming the bottom of the recesses in the wider sides of the post,

a shelf bracket clamp plate of extruded cross section having a flat outer base with an inwardly inclined flange disposed at the same angle as the divergent angle in said slots,

said plate being narrower than said slots and having rearwardly turned flanges on its opposite edge from said inclined flange,

a bolt receiving opening formed through the front portion of said plate between a gap formed between said rearwardly turned flanges,

slots formed through said plate above and below said bolt receiving hole,

a flat shelf supporting bracket abutted endwise against said plate and having tongues extending through said slots,

at least one of said tongues being staked on its rear side over the back side of said plate,

a T-shaped slot formed in the end of said shelf supporting bracket with the base of the T opposed to said hole in said plate,

a clamp bolt having a head positioned in the cross section of said T slot with its shank projecting through the base of the slot and the hole in said plate,

a rectangular nut having an offset hole therein threadedly engaged with the shank of said bolt with the

longer end of the nut projecting between the rearwardly turned flanges on said plate into clamping engagement with one of the divergent sides of one of the slots in said post and with the shorter side of the nut bearing against the inner face of the inclined flange on said plate,

a panel attaching clip of sheet metal having a central body portion with a rearwardly inclined flange on one edge disposed at the same angle as the divergent inner surface of said slots in said post and with spaced rearwardly turned flanges on the opposite side of the body,

a screw receiving hole formed in said central body portion between said rearwardly turned flanges,

a screw having its head engaging the outer side of said clip body and passing through the hole therein,

a rectangular nut having an offset hole formed therein and threadingly receiving the shank of said screw with the shorter end of the nut engaging the inner side of the inclined flange on said body and with the longer end of the nut engaging the opposite beveled edge of the slot in the post,

the inclined flange of said clip being inwardly offset opposite said shorter end of said nut,

the upper portion of the central body of said clip being inwardly inclined from the top downwardly and defining an upwardly opening cam slot above said screw mounted in said panel to be supported from the clip,

a fixture supporting clip formed of sheet metal with a flat central body having an angled flange turned rearwardly along one edge at an angle corresponding to the beveled inner surfaces of the slots in said post and having spaced rearwardly turned flanges on its opposite edge,

a screw receiving hole formed through the flat body of the fixture supporting clip between said spaced flanges,

a screw having its shank received in said hole and engaging a rectangular nut having an offset hole therein with the shorter end of the nut engaged with the inner side of said angled flange and the longer end of the nut engaged with the inclined face on the opposite side of the slot in the post,

the angled flange on said fixture attaching clip being rearwardly and inwardly offset opposite said nut,

an opening formed through said flat body of said fixture supporting clip in spaced relation to said screw receiving hole,

and inwardly extruded bosses formed in the ends of the body of said fixture supporting clip and internally threaded to receive mounting screws for connecting fixture supports thereto.

3. In a supporting post, panel and shelf bracket assembly and connecting means therebetween,

a post of extruded uniform cross section from end to end having parallel longer sides connected by parallel shorter sides,

slots of equal width formed centrally in each of said sides with inwardly divergent sides merging with spaced coplanar inner surfaces on opposite sides of an inner recess,

a central web connecting the bases of the recesses in the shorter sides of the post and forming the bottom of the recesses in the wider sides of the post,

a shelf bracket clamp plate of extruded cross section having a flat outer base with an inwardly inclined flange disposed at the same angle as the divergent angle in said slots,

said plate being narrower than said slots and having rearwardly turned flanges on its opposite edge from said inclined flange,

a bolt receiving opening formed through the front portion of said plate between a gap formed between said rearwardly turned flanges,

slots formed through said plate above and below said bolt receiving hole,

a flat shelf supporting bracket abutted endwise against said plate and having tongues extending through said slots,

at least one of said tongues being staked on its rear side over the back side of said plate,

a T-shaped slot formed in the end of said shelf supporting bracket with the base of the T opposed to said hole in said plate,

a clamp bolt having a head positioned in the cross section of said T slot with its shank projecting through the base of the slot and the hole in said plate,

a rectangular nut having an offset hole therein threadedly engaged with the shank of said bolt with the longer end of the nut projecting between the rearwardly turned flanges on said plate into clamping engagement with one of the divergent sides of one of the slots in said post and with the shorter side of the nut bearing against the inner face of the inclined flange on said plate,

a panel attaching clip of sheet metal having a central body portion with a rearwardly inclined flange on one edge disposed at the same angle as the divergent inner surface of said slots in said post and with spaced rearwardly turned flanges on the opposite side of the body,

a screw receiving hole formed in said central body portion between said rearwardly turned flanges,

a screw having its head engaging the outer side of said clip body and passing through the hole therein,

and a rectangular nut having an offset hole formed therein and threadingly receiving the shank of said screw with the shorter end of the nut engaging the inner side of the inclined flange on said body and with the longer end of the nut engaging the opposite beveled edge of the slot in the post,

the inclined flange of said clip being inwardly offset opposite said shorter end of said nut,

the upper portion of the central body of said clip being inwardly inclined from the top downwardly and defining an upwardly opening cam slot above said screw adapted to cammingly receive the head of a screw mounted in a panel to be supported from the clip.

4. In a supporting post, panel, shelf bracket and fixture assembly and connecting means therebetween,

a post of uniform cross section from end to end having parallel longer sides connected by parallel shorter sides,

slots of equal width formed centrally in each of said sides with inwardly divergent sides merging with spaced co-planar inner surfaces on opposite sides of an inner recess,

a central web connecting the bases of the recesses in the shorter sides of the post and forming the bottom of the recesses in the wider sides of the post,

a shelf bracket clamp plate having a flat outer base with an inwardly inclined flange disposed at the same angle as the divergent angle in said slots,

said plate being narrower than said slots and having rearwardly turned flanges on its opposite edge from said inclined flange,

a bolt receiving opening formed through the front portion of said plate and offset upwardly from the center thereof and between a gap formed between said rearwardly turned flanges,

slots formed through said plate above and below said bolt receiving hole,

a flat shelf supporting bracket abutted endwise against said plate and having tongues extending through said slots,

at least one of said tongues being staked on its rear side over the back side of said plate,

a T-shaped slot formed in the end of said shelf support-

ing bracket with the base of the T opposed to said hole in said plate,

a clamp bolt having a head positioned in the cross section of said T slot with its shank projecting through the base of the slot and the hole in said plate,

a rectangular nut having an offset hole therein threadedly engaged with the shank of said bolt with the longer end of the nut projecting between the spaced flanges on said plate into clamping engagement with one of the slots in said post and with the shorter side of the nut bearing against the inner face of the inclined flange on said plate,

a panel attaching clip having a central body portion with a rearwardly inclined flange on one edge disposed at the same angle as the divergent inner surface of said slots in said post and with spaced rearwardly turned flanges on the opposite side of the body,

a screw receiving hole formed in said body portion between said rearwardly turned flanges,

a screw having its head engaging the outer side of said body and passing through the hole therein,

an elongated nut having an offset hole formed therein and threadingly receiving the shank of said screw with the shorter end of the nut engaging the inner side of the inclined flanges on said body and with the longer end of the nut engaging the opposite beveled edge of the slot in the post,

the inclined flange of said clip being inwardly offset opposite said shorter end of said nut,

the upper portion of the central body of said clip being inwardly inclined from the top downwardly and defining an upwardly opening cam slot above said screw adapted to cammingly receive the head of a screw mounted in a panel to be supported from the clip,

a fixture supporting clip formed with a flat central body having an angled flange turned rearwardly along one edge at an angle corresponding to the beveled inner surfaces of the slots in said post and having spaced rearwardly turned flanges on its opposite edge,

a screw receiving hole formed through the flat body of the fixture supporting clip between said spaced flanges,

a screw having its head received in said hole and engaging an elongated nut having an offset hole therein with the shorter end of the nut engaged with the inner side of said angled flange and the longer end of the nut engaged with the inclined face on the opposite side of the slot in the post,

the angled flange on said fixture attaching clip being rearwardly and inwardly offset opposite said nut,

an opening formed through said flat body of said fixture supporting clip in spaced relation to said screw receiving hole,

and inwardly extruded bosses formed in the ends of the body of said fixture supporting clip and internally threaded to receive mounting screws for connecting fixture supports thereto.

5. In a supporting post, panel, shelf bracket and fixture assembly and connecting means therebetween,

a post of uniform cross section from end to end having parallel longer sides connected by parallel shorter sides,

slots of equal width formed centrally in each of said sides with inwardly divergent sides merging with spaced co-planer inner surfaces on opposite sides of an inner recess,

a central web connecting the bases of the recesses in the shorter sides of the post and forming the bottom of the recesses in the wider sides of the post,

a shelf bracket clamp plate having a flat outer base with an inwardly inclined flange disposed at the same angle as the divergent angle in said slots,

said plate being narrower than said slots and having

rearwardly turned flanges on its opposite edge from said inclined flange,

a bolt receiving opening formed through the front portion of said plate between a gap formed between said rearwardly turned flanges,

slots formed through said plate,

a shelf supporting bracket abutted endwise against said plate and having tongues extending through said slots,

at least one of said tongues being staked on its rear side over the back side of said plate,

a T-shaped slot formed in the end of said shelf supporting bracket with the base of the T opposed to said hole in said plate,

a clamp bolt having a head positioned in the cross section of said T slot with its shank projecting through the base of the slot and the hole in said plate,

a rectangular nut having a hole therein threadedly engaged with the shank of said bolt with the longer end of the nut projecting between the spaced flanges on said plate into clamping engagement with one side of one of the slots in said post and with the other end of the nut bearing against the inner face of the inclined flange on said plate,

a panel attaching clip having a central body portion with a rearwardly inclined flange on one edge disposed at the same angle as the divergent inner surface of said slots in said post and with spaced rearwardly turned flanges on the opposite side of the body,

means on said body portion of said panel attached clip formed to receive a connecting member from a panel,

a screw receiving hole formed in said body portion between said rearwardly turned flanges,

a screw having its head engaging the outer side of said body and passing through the hole therein,

a nut having a hole formed therein and threadingly receiving the shank of said screw with one end of the nut engaging the inner side of the inclined flange on said body and with the other end of the nut engaging the opposite beveled edge of the slot in the post,

a fixture supporting clip formed with a flat central body having an angled flange turned rearwardly along one edge at an angle corresponding to the beveled inner surfaces of the slots in said post and having spaced rearwardly turned flanges on its opposite edge,

a screw receiving hole formed through the flat body of the fixture supporting clip between said spaced flanges,

a screw having its head received in said hole and engaging a nut having a hole therein with one end of the nut engaged with the inner side of said angled flange and the other end of the nut engaged with the inclined face on the opposite side of the slot in the post,

an opening formed through said flat body of said fixture supporting clip in spaced relation to said screw receiving hole,

and extruded bosses formed in the ends of the body of said fixture supporting clip and internally threaded to receive mounting screws for connecting fixture supports thereto.

6. In a supporting post, panel and shelf bracket assembly and connecting means therebetween,

a post of uniform cross section from end to end having parallel longer sides connected by parallel shorter sides,

slots of equal width formed centrally in each of said sides with inwardly divergent sides merging with spaced co-planer inner surfaces on opposite sides of an inner recess,

a central web connecting the bases of the recesses in

the shorter sides of the post and forming the bottom of the recesses in the wider sides of the post,

a shelf bracket clamp plate having a flat outer base with an inwardly inclined flange disposed at the same angle as the divergent angle in said slots,

said plate being narrower than said slots and having rearwardly turned flanges on its opposite edge from said inclined flange,

bolt receiving opening formed through the front portion of said plate between a gap formed between said rearwardly turned flanges,

slots formed through said plate,

a shelf supporting bracket abutted endwise against said plate and having tongues extending through said slots,

at least one of said tongues being staked on its rear side over the back side of said plate,

a T-shaped slot formed in the end of said shelf supporting bracket with the base of the T opposed to said hole in said plate,

a clamp bolt having a head positioned in the cross section of said T slot with its shank projecting through the base of the slot and the hole in said plate,

a rectangular nut having an offset hole therein threadedly engaged with the shank of said bolt with the longer end of the nut projecting between the spaced flanges on said plate into clamping engagement with one of the slots in said post and with the shorter side of the nut bearing against the inner face of the inclined flange on said plate,

a panel attaching clip having a central body portion with a rearwardly inclined flange on one edge disposed at the same angle as the divergent inner surface of said slots in said post and with spaced rearwardly turned flanges on the opposite side of the body,

a screw receiving hole formed in said body portion between said rearwardly turned flanges,

a screw having its head engaging the outer side of said body and passing through the hole therein,

and an elongated nut having an offset hole formed therein and threadingly receiving the shank of said screw with the shorter end of the nut engaging the inner side of the inclined flanges on said body and with the longer end of the nut engaging the opposite beveled edge of the slot in the post,

the upper portion of the central body portion of said clip being inwardly inclined from the top downwardly and defining an upwardly opening cam slot above said screw adapted to cammingly receive the head of a screw mounted in a panel to be supported from the clip.

7. A supporting post, shelf bracket assembly and connecting means therebetween comprising,

a post of extruded uniform cross section from end to end having parallel longer sides connected by parallel shorter sides,

slots of equal width formed centrally in each of said sides with inwardly divergent sides merging with spaced co-planer inner surfaces on opposite sides of an inner recess,

a central web connecting the bases of the recesses in the shorter sides of the post and forming the bottom of the recesses in the wider sides of the post,

a shelf bracket clamp plate of extruded cross section having a flat outer base with an inwardly inclined flange disposed at the same angle as the divergent angle in said slots,

said base being narrower than said slots and having rearwardly turned flanges on its opposite edge from said inclined flange,

a bolt receiving opening formed through the front portion of said plate and offset upwardly from the center thereof and between a gap formed between said rearwardly turned flanges,

slots formed through said plate above and below said bolt receiving hole,

a flat shelf supporting bracket abutted endwise against said plate and having tongues extending through said slots,

at least one of said tongues being staked on its rear side over the back side of said plate,

a T-shaped slot formed in the end of said shelf supporting bracket with the base of the T opposed to said hole in said plate,

a clamp bolt having a head positioned in the cross section of said T slot with its shank projecting through the base of the slot and the hole in said plate,

and an elongated nut having an offset hole therein threadedly engaged with the shank of said bolt with the longer end of the nut projecting between the flanges on said plate into clamping engagement with one of the divergent sides of one of the slots in said post and with the shorter side of the nut bearing against the inner face of the inclined flange on said plate.

8. A supporting post, shelf bracket assembly and connecting means therebetween comprising,

a post of uniform cross section from end to end having parallel opposed sides,

slots of equal width formed centrally in each of said sides with inwardly divergent sides merging with spaced co-planer inner surfaces on opposite sides of an inner recess,

a shelf bracket clamp plate of substantial thickness having a flat outer base with an inwardly inclined flange disposed at the same angle as the divergent angle in said slots,

said base being narrower than said slots and having rearwardly turned flanges on its opposite edge from said inclined flange,

a bolt receiving opening formed through the front portion of said plate and between a gap formed between said rearwardly turned flanges,

slots formed through said plate,

a flat shelf supporting bracket abutted endwise against said plate and having tongues extending through said slots,

at least one of said tongues being staked on its rear side over the back side of said plate,

a T-shaped slot formed in the end of said shelf supporting bracket with the base of the T opposed to said hole in said plate,

a clamp bolt having a head positioned in the cross section of said T slot with its shank projecting through the base of the slot and the hole in said plate,

a clamp bolt having a head positioned in the cross section of said T slot with its shank projecting through the base of the slot and the hole in said plate,

and an elongated nut having an offset hole therein threadedly engaged with the shank of said bolt with the longer end of the nut projecting between the flanges on said plate into clamping engagement with one of the divergent sides of one of the slots in said post and with the shorter side of the nut bearing against the inner face of the inclined flange on said plate.

9. A supporting post, shelf bracket assembly and connecting means therebetween comprising,

a post of extruded uniform cross section from end to end having parallel longer sides connected by parallel shorter sides,

slots of equal width formed centrally in each of said sides with inwardly divergent sides merging with spaced co-planer inner surfaces on opposite sides of an inner recess,

a central web connecting the bases of the recesses in

the shorter sides of the post and forming the bottom of the recesses in the wider sides of the post,

a shelf bracket clamp plate of extruded cross section having a flat outer base with an inwardly inclined flange disposed at the same angle as the divergent angle in said slots,

said base being narrower than said slots and having rearwardly turned flanges on its opposite edge from said inclined flange,

a bolt receiving opening formed through the front portion of said plate and offset upwardly from the center thereof and between a gap formed between said rearwardly turned flanges,

slots formed through said plate above and below said bolt receiving hole,

a flat shelf supporting bracket abutted endwise against said plate and having tongues extending through said slots,

at least one of said tongues being staked on its rear side over the back side of said plate,

a clamp bolt having a head positioned in abutting relation to a portion of said bracket with its shank projecting through the hole in said plate,

and an elongated nut having an offset hole therein threadedly engaged with the shank of said bolt with the longer end of the nut projecting between the flanges on said plate into clamping engagement with one of the divergent sides of one of the slots in said post and with the shorter side of the nut bearing against the inner face of the inclined flange on said plate.

10. A panel attaching clip for connecting panels to posts having slots with inwardly divergent sides formed longitudinally in sides of the post comprising,

a clip of stamped sheet metal having a central body portion with a rearwardly inclined flange on one edge disposed at a predetermined angle with spaced rearwardly turned flanges on the opposite side of the flat body,

a screw receiving hole formed in said body between said rearwardly turned flanges,

a screw having its head countersunk into the outer side of said body and passing through the hole therein,

an elongated nut having an offset hole formed therein and threadingly receiving the shank of said screw with the shorter end of the nut engaging the inner side of the inclined flange on said body and with the longer end of the nut adapted to engage the opposite side of a slot in such a post,

the inclined flange of said clip being inwardly offset opposite said shorter end of said nut,

the upper portion of the central body of said clip being inwardly offset and inclined on its inner side from the top downwardly and defining an upwardly opening cam slot above said screw adapted to cammingly receive the head of a screw mounted in a panel to be supported from the clip.

11. A panel attaching clip for connecting panels to posts having slots with inwardly divergent sides formed longitudinally in sides of the post comprising,

a clip having a central body portion with a rearwardly inclined flange on one edge disposed at a predetermined angle with spaced rearwardly turned flanges on the opposite side of the flat body,

a screw receiving hole formed in said body between said rearwardly turned flanges,

a screw having its head engaging the outer side of said body and passing through the hole therein,

an elongated nut having an offset hole formed therein and threadingly receiving the shank of said screw with the shorter end of the nut engaging the inner side of the inclined flange on said body and with the longer end of the nut adapted to engage the opposite side of a slot in such a post,

the upper portion of the central body of said clip being

inwardly inclined on its inner side from the top downwardly and defining an upwardly opening cam slot above said screw adapted to cammingly receive the head of a screw mounted in a panel to be supported from the clip.

12. A fixture supporting clip for attaching fixtures to a post having slots with inwardly divergent sides formed in the sides of the post comprising,

a sheet metal stamping with a flat central body having an angled flange turned rearwardly along one edge at a predetermined angle having spaced rearwardly turned flanges on its opposite edge,

a countersunk screw receiving hole formed through the body of the clip between said spaced flanges,

a screw having its head received in said hole and engaging an elongated nut having an offset hole therein with the shorter end of the nut engaged with the inner side of said angled flange and the longer end of the nut adapted to engage with the inclined face on the opposite side of a slot in such a post,

the angled flange on said clip being rearwardly and inwardly offset opposite said nut,

an opening formed through said body in spaced relation to said screw receiving hole,

and inwardly extruded bosses formed in the ends of the body and internally threaded to receive mounting screws for connecting fixtures thereto.

13. A fixture supporting clip for attaching fixtures to a post having slots with inwardly divergent sides formed in the sides of the post comprising,

a central body having an angled flange turned rearwardly along one edge at a predetermined angle having spaced rearwardly turned flanges on its opposite edge,

a screw receiving hole formed through the body of the clip between said spaced flanges,

a screw having its head received in said hole and engaging an elongated nut having an offset hole therein with the shorter end of the nut engaged with the inner side of said angled flange and the longer end of the nut adapted to engage with the inclined face on the opposite side of a slot in such a post,

an opening formed through said body in spaced relation to said screw receiving hole,

and extruded bosses formed in the ends of the body and internally threaded to receive mounting screws for connecting fixtures thereto.

14. A post and connections for selectively attaching articles thereto comprising an extruded post of uniform cross section from end to end and having opposite longer sides connected by opposite shorter sides with central slots formed longitudinally in each side,

said slots having inwardly divergent sides merging at the bottom with co-planer inner surfaces parallel with the sides of the post and with inwardly opening recesses between said co-planer surfaces,

a vertically elongated article supporting member narrower than the width of said slots and having a rearwardly angled flange on one side disposed at an angle corresponding to the angled inner surfaces of said slots,

spaced rearwardly turned perpendicular flanges on the opposite edge of said article supporting member adapted to abut one inner surface of said slots in said posts,

said article supporting member having a screw receiving hole formed therethrough between the spaced flanges on the member,

a clamp screw extending through said hole in said member,

and an elongated rectangular nut having a threaded hole formed therethrough in off-center relation to the longer length of the nut and engaging the screw with the shorter end of the nut engaged with the inner side of the angled flange on the member and with the longer end of the nut extending nonrotatably

between said spaced flanges and engaged with the divergent inner side of the slot in the post on the opposite side from said angled flange,

and means on said member for attaching an article thereto.

15. A post and connections for selectively attaching articles thereto comprising a post of uniform cross section from end to end and having central slots formed longitudinally in each side,

said slots having inwardly divergent sides merging at the bottom with co-planer inner surfaces parallel with the side of the post,

a vertically elongated article supporting member narrower than the width of said slots and having a rearwardly angled flange on one side disposed at an angle corresponding to the angled inner surfaces of said slots,

spaced rearwardly turned perpendicular flanges on the opposite edge of said article supporting member adapted to abut one inner surface of said slots in said post,

said article supporting member having a screw receiving hole formed therethrough between the spaced flanges on the member,

a clamp screw extending through said hole in said member,

and an elongated nut having a threaded hole formed therethrough in off-center relation to the longer length of the nut and engaging the screw with the shorter end of the nut engaged with the inner side of the angled flange on the member and with the longer end of the nut extending nonrotatably between said spaced flanges and engaged with the divergent inner side of the slot in the post on the opposite side from said angled flange,

and means on said member for attaching an article thereto.

16. A post and connections for selectively attaching articles thereto comprising a post with central slots formed longitudinally in some sides,

said slots having inwardly divergent sides merging at the bottom with co-planer surfaces parallel with the sides of the post,

a vertically elongated article supporting member narrower than the width of said slots and having a rearwardly angled flange disposed at an angle corresponding to the angled inner sides of said slots,

spaced rearwardly turned perpendicular flanges on the opposite side of said member adapted to abut one inner surface of said slots in said post,

said member having a screw receiving hole formed therethrough between the spaced flanges on the member,

a clamp screw extending through said hole in said member,

and an elongated rectangular nut having a threaded hole formed therethrough in off-center relation to the longer length of the nut and engaging the screw with the shorter end of the nut engaged with the inner side of the angled flange on the member and with the longer end of the nut extending nonrotatably between said spaced flanges and engaged with the divergent inner side of the slot in the post on the opposite side from said angled flange,

and means on said supporting member for attaching an article thereto.

17. A post and connections for selectively attaching articles thereto comprising a post with slots formed longitudinally in some sides,

said slots having inwardly divergent sides merging at the bottom in inner cross surfaces,

a vertically elongated article supporting member narrower than the width of said slots and having a rearwardly angled flange disposed at an angle corresponding to the angled inner sides of said slots,

spaced rearwardly turned projections on the opposite side of said member,

said member having a screw receiving hole formed therethrough between the spaced projections on the member,

a clamp screw extending through said hole in said member,

and an elongated nut having a threaded hole formed therethrough in off-center relation to the longer length of the nut and engaging the screw with the shorter end of the nut engaged with the inner side of the angled flange on the member and with the lower end of the nut extending nonrotatably between said spaced projections and engaged with the divergent inner side of the slot in the post on the opposite side from said angled flange,

and means on said supporting member for attaching an article thereto.

18. A post and connections for selectively attaching articles thereto comprising a post with slots formed longitudinally in some sides,

said slots having inwardly divergent sides,

a vertically elongated article supporting member narrower than the width of said slots and having a rearwardly angled flange disposed at an angle corresponding to the angled inner sides of said slots,

spaced rearwardly extending projections on the opposite side of said member,

said member having a screw receiving hole formed therethrough between the spaced projections on the member,

a clamp screw extending through said hole in said member,

and a nut having a threaded hole formed therethrough and engaging the screw with the one end of the nut engaged with the inner side of the angled flange on the member and with the other end of the nut extending nonrotatably between said spaced projections and engaged with the divergent inner side of the slot in the post on the opposite side from said angled flange,

and means on said supporting member for attaching an article thereto.

References Cited by the Examiner

UNITED STATES PATENTS

866,695	9/07	Taussig	248—24
2,607,447	8/52	Tuttle	189—36
2,940,718	6/60	Beal	248—245
2,991,040	7/61	Levy	211—86 X
3,111,723	11/63	Bates	248—244 X

CLAUDE A. LE ROY, *Primary Examiner.*