EXTERIOR WALL ACCESSORIES
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Claims

ABSTRACT OF THE DISCLOSURE

Exterior batten assemblies for securing building facings to building superstructure in which exterior batten strips are securely fastened to interior batten strips for support of building facings by means of elongated projections defining a cavity in which one interior surface of the cavity is substantially flat while the opposing surface is ribbed for firmly receiving an embracing fastening means threadedly engaged within the cavity. The batten strips are further provided with mounting projections having apertures. The mounting projection is further provided with elongated notches extending transverse to the length thereof interspersed between the apertures. The notches permit selective bonding of portions of the mounting flange.

The instant invention relates to exterior building assembles and more particularly to assemblies of novel design useful in finishing off buildings and like commercial establishments and exhibiting superior strength, greater ease of handling and assembly, as well as flexibility of use. This invention is a division of application Ser. No. 549,834, filed May 13, 1966 now patent No. 3,443,350 by the inventor of the present application.

Modern construction techniques have recently placed great emphasis upon new exterior wall structures which provide a great deal of esthetic appeal only at the same time providing strong, reliable building facings or walls which are simple in design, flexible in their application and which greatly simplify assembly thereof.

The building facings may be comprised of large, usually rectangular shaped panels which are secured directly to the building framework or superstructure by batten assemblies which rigidly position and secure the panels to the building structure as well as providing adequate sealing along the joining edges of adjacent panels to prevent rain, moisture or other elements from entering into the building proper. Each batten assembly is comprised of interior and exterior batten strips secured together by suitable fastening means so as to embrace the marginal edges of adjacent panels. The exterior batten of one preferred embodiment is provided with a pair of cooperating spaced parallel projections adapted for receiving the forward end of a threaded member. One interior wall of a first projection is ribbed to guide the insertion of the threaded member; the interior wall of the remaining projection is provided with a V-shaped groove near the top of the projection for the purpose of guiding the threaded member into the space between the projections. The projections are formed of a material having characteristics which permit the threaded member to cut grooves into the flat interior surface of the remaining projections so as to be firmly threadedly engaged therein. Such batten strips are typically formed of extruded aluminum which yield the above desirable characteristics. The distance between the flat interior wall and the crests of the ribs on the opposite interior wall of the projection is selected so as to be slightly less than the distance between the roots of the screw thread on diametrically opposed sides of the screw. It has been found that by making this distance between zero to 15,000 of an inch less than the distance between two diametrically opposed roots of the screw member, the pulling power of the screw, when threaded therein, more than triples thereby providing a batten assembly having extremely large holding strength.

The external batten members are further provided with flanges along their opposing edges which are arranged a spaced distance from the external surface of the panels which they embrace. Arranging the flanges in this manner provides adequate clearance for receiving the ends of intersecting battens between the flanges and the external surface of the panels and further facilitates the introduction of caulking which is a far superior sealant to those methods which have previously been employed.

The external surface of the exterior batten members are further provided with a pair of upstanding grooves for receiving feature strips which may be of any suitable color or styling to further enhance the aesthetic appearance of the batten members.

Such exterior batten assemblies are typically secured to the building superstructure by means of clips which are bolted or otherwise suitably fastened to the beam or beams forming the building's superstructure. The mounting of exterior wall assemblies within a single building quite frequently requires a variety of fastening clips due to the variety of forms of superstructure. Such requirements complicate both handling and assembly. The instant invention, however, provides a universal clip which is quite flexible in use and is thereby capable of being employed in all possible mounting applications thereby greatly simplifying both handling and assembling operations. The universal clip is an L-shaped member formed of a flat sheet of steel, preferably of ¼ inch thickness. One arm of the member is provided with a pair of elongated openings arranged as spaced intervals to one another and each being aligned transverse to the alignment of the first opening provided in the first arm. Provision of elongated openings provides a sufficient tolerance for aligning the clip with the batten assemblies as well as providing for normal expansion and contraction of the batten assemblies. These arrangements provide for normal expansion and contraction in two mutually perpendicular directions while at the same time providing suitable support for the batten assemblies and the panel members which they, in turn, support. The thickness of the universal clip is sufficient to permit bending of an arm in order to provide securement to an L-beam having a vertically aligned mounting surface. As an alternative embodiment, the universal clip may be replaced by an interior batten strip having an elongated projection extending from its interior surface, which strip is capable of being secured to the building structure mounting surface by means of fastening either to the horizontal surface of a U-shaped beam or the vertical surface of an L-beam.

In cases where horizontal batten assemblies are employed for the purpose of positioning and supporting exterior panel members, still another simplified embodiment is provided, which embodiment comprises a substantially H-shaped batten strip having a pair of downwardly depending arms for embracing the upper marginal edge of a panel member and having a pair of upwardly aligned arms for receiving the lower horizontal marginal edge of another panel member. The upwardly aligned arms are each provided with a pair of flanges upon which the lower horizontal edge of the upper panel rests. The upper arm, which is positioned toward the building interior, is provided with a weakening groove aligned just
slightly below its panel supporting flange which weakens the arm at that point causing the arm having the weakening groove to bend inwardly under the weight of the panel member to provide an excellent force-fit of the panel member between the upwardly aligned arms. The H-shaped unitary batten assembly may further be provided with an inwardly directed flange directed toward the building interior for the purpose of securing the H-shaped batten assembly to the building superstructure.

Another object of the instant invention is to provide novel batten assemblies which greatly simplify handling and assembly while at the same time providing the requisite amount of support and rigidity required of such exterior panel assemblies.

Another object of the instant invention is to provide novel two-piece batten assembly having an elongated opening for receiving a threaded member which is so designed as to have a width no greater than the diameter of the threaded member between diametrically opposed roots of the said member so as to significantly improve the pulling force of the threaded engagement.

Another object of the instant invention is to provide a novel batten assembly comprising an exterior batten strip having flanges spaced from the surface of the panel members which are provided for receiving batten strips as well as for the receipt of a sealant to provide an excellent seal against the intrusion of water or other external influences from entering into the building interior.

Another object of the instant invention is to provide a novel exterior batten assembly wherein the exterior batten strip is provided with a pair of undercut grooves on its exterior surface for the receipt of feature strips of a variety of colors or designs to further enhance the aesthetic appearance of the batten members.

Another object of the instant invention is to provide novel batten assemblies for use in finishing exterior comprising a novel universal clip to permit rigid securement of the batten assemblies to the building superstructure in a variety of differing positions.

Another object of the instant invention is to provide a novel unitary batten assembly for use in finishing building interiors and having at least one pair of embracing arms for receiving the marginal edge of a panel member andone which weakens the supporting strength of at least one of said arms in order to provide an excellent force-fit between the panel member and pair of arms

These and other objects of the instant invention will become apparent when reading the accompanying description and drawings in which:

FIG. 1 is an end view of a batten assembly designed in accordance with the principles of the instant invention;

FIG. 1a is an elevational view showing the exterior batten assembly and threaded member of FIG. 1 in greater detail;

FIG. 2 shows a manner in which a batten assembly is the type shown in FIG. 1, but embraces a pair of panel members;

FIG. 3 shows an alternative embodiment for the batten assembly in FIG. 2;

FIG. 4 shows another alternative embodiment for the batten assemblies of FIGS. 2 and 3;

FIG. 5a is a perspective view of a universal clip for securing the batten assemblies of the instant invention;

FIG. 5b is a perspective view showing another application for the universal clip of FIG. 5a;

FIG. 5c shows still another application for the universal clip of FIG. 5a;

FIG. 5d is a perspective view showing a batten assembly wherein the universal clip is formed as integral part of the interior batten strip;

FIG. 6 is a perspective view showing a one-piece batten assembly and a method of securing the same to the building superstructure.

FIG. 6a shows an alternative manner for securing the batten assembly in FIG. 6 to the building superstructure.

FIG. 1 shows a batten assembly 10 which is comprised of an exterior batten strip 11 and an interior batten strip 12. The exterior batten strip, so named because it faces the exterior surface of a building or other structure, is comprised of a central portion 13 having a pair of upwardly directed projections 14 and 15 for receiving a threaded member therebetween. The interior surface of projection 15 is provided with a plurality of ribs 16 which are substantially spaced from one another by an amount of substantially equivalent to the pitch of the threaded member 17. The interior surface of projection 15 is further provided with a tapered portion 18 near its free end to facilitate insertion of threaded member 17.

The interior surface of projection 14 is substantially flat, however, a single substantially V-shaped groove 19 is provided near its top edge. This groove acts as a "starting groove" for the threads of the threaded member 17 therethrough. The distinct advantage of such a groove receiving structure is that the projections 14 and 15 run substantially the entire length of the exterior batten strip 11 which may be as long as 20, 30 or 40 feet. Using this arrangement, there is no problem whatsoever of aligning the bolt center between the opposing interior batten strip 12 which receives threaded member 17 so as to insure its proper alignment with the screw receiving projections 14 and 15. Thus, no care whatsoever need be exercised in the location of the opening in interior batten strip 12.

The batten strips are secured to one another in the following manner:

An opening 20 is drilled in the central portion 21 of interior batten strip 12 which is of a diameter sufficient to permit the threaded member 17 to pass therethrough while providing a suitable support for the head 17a of the threaded member. The panel members 22 and 23 to be embraced by the batten strips 12 and 13 are positioned substantially in the manner shown in FIGURE 1, and the forward end 17b of threaded member 17 is positioned between the tapered surface 18 and the "starting groove" 19 of projections 14 and 15. Threaded member 17 is then rotated by any suitable tool such as a screwdriver, wrench, and the like. The rotation of the thread in this manner causes it to engage the opposing surfaces of projections 14 and 15. The ribs 16 and the "starting groove" 19 cause the threaded member to be driven vertically downward and to cut grooves or ribs into the flat interior surface of projection 14. The rotating operation may be performed until the marginal edges of panels 22 and 23 are firmly embraced by the batten strips 12 and 13.

FIG. 1a shows an enlarged view of the projections 14 and 15 and the manner in which they are formed so as to significantly improve the pulling strength of the batten assemblies. The distance D between the crests of ribs 16 and the interior surface 14a is selected so as to be equal to or less than the distance D2 between diametrically opposed roots of the threaded member 17. As one exemplary embodiment, the distance D was 180 thousandths of an inch. Since the batten strips are preferably extruded from aluminum, the characteristics of the extruded aluminum caused the aluminum to yield slightly with threading of the screw member so as to permit threading engagement between the batten strip and the threaded member. It was found that with this arrangement the pulling strength of the batten assembly was better than three to four times greater than the pulling strength of ordinary batten assemblies, wherein the distance D is conventionally greater than the distance
It was found that this improvement in pulling strength is significantly improved when the distance $D$ is either equal to the distance $D_1$, or less than the distance $D_2$, by as much as 15 thousandths of an inch.

Since the distance $D$ is always equal to or less than $D_1$, the tapered surface 18 is provided to permit starting of the thread member 17 into threaded engagement with the interior surfaces of projections 14 and 15. The tapered surface 18 permits the forward end of threaded member 17 to enter to a sufficient depth so that one crest 17' of the thread member will embrace the "shoulder" along surface 14a to readily permit threading operation. The result of these dimensional relationships were found to be so good that no slippage of the thread occurred during the performance of a strength test until maximum load was reached, at which time failure was due only to the shearing of the aluminum.

FIG. 2 shows a batten assembly 10 substantially identical to that shown in FIG. 1 in a position embracing a pair of exterior panels 22 and 23. The interior surface of the batten strip 13 is provided with a pair of double undercut grooves 24 and 25 (see FIG. 1) to receive mating projections 26 and 27, so as to provide a good seal between batten strip 13 and the surface of panel members 22 and 23. The batten strip 12 is likewise provided with a pair of double undercut grooves 28 and 29 which may receive elongated sealing strips of the same general configuration as the strips 26 and 27. This is not absolutely necessary since the batten strips 12 are positioned within the building interior.

As will be further noted, the batten strip 13 is provided with a pair of outwardly directed flanges 30 and 31 which are positioned a spaced distance away from the exterior surfaces of panel members 22 and 23. This arrangement provides suitable clearance for the receipt of intersecting batten strips so as to permit the edges of an intersecting strip, such as, for example, the strip 32 so as to provide a nearer finish on the building exterior by concealing the edge of the intersecting batten strip which may be roughly finished due to a cutting operation. A further advantage of the flanges 30 and 31 is that they provide a confined space for the receipt of a sealant 33 such as, for example, a caulking compound to provide an excellent air and water-tight seal between the exterior batten strip and the exterior surfaces of the panels. The sealing gaskets 26 and 27 normally provide adequate seals under average conditions, but do not have the ability to alter their shape considerably so as to follow all imperfections, crevices, etc., to provide the excellent sealing characteristics which can be achieved through the use of a caulking compound. The flanges 30 and 31, in addition to providing a rather confined space for receiving the sealant, act to substantially conceal the sealant from view so that its presence does not mar the aesthetic appearance of the batten assembly.

A further aesthetic feature provided by the batten strip 13 is the provision of a pair of undercut grooves 34 and 35 (see FIG. 1) for the receipt of a feature strip 36 which may be an elongated strip of plastic, metal or any other suitable material, which may be of any color or finish desired so as to further enhance the aesthetic appearance of the assembly. These feature strips may be selected to blend with the decor of the panels 22 and 23, and may also be removed and replaced by feature strips of other colors or finishes if it is also desired to refresh the panels 22 and 23, or replace them with panel members of other finishes or colors.

FIG. 3 shows another embodiment 10' of a batten assembly of the type shown in FIGS. 1 and 2, wherein the exterior surface of the exterior batten strip 13 is provided with a pair of outwardly directed projections 37 and 38 to provide a shadow effect to further enhance the aesthetic appearance of the batten assembly.

FIG. 4 shows another embodiment 10" in which the exterior batten strip 13' commonly referred to as a mullion is substantially similar to the batten assembly of FIG. 2 or 3. This arrangement shows still another aesthetic feature which may be provided by means of the mullion structure which projects a significant degree outwardly from the building surface so as to provide more pronounced shadow effects for the structure. Any of the structures of FIG. 1-4, however, incorporate the idea of the superior pulling strength of the screw receiving projections as well as providing the flanges for receipt of caulking compounds and intersecting batten assemblies without any reduction in aesthetic appearance of the completed assemblies. The spacing between any of the flanges 30 and 31 from the exterior surface of the panel members is sufficient so that an intersecting batten such as batten 39, shown in FIG. 4, is positioned behind flange 31 there is still better than 1/4 of an inch clearance for the receipt of a caulking compound to prevent an adequate seal, even in the presence of the intersecting batten.

FIG. 5a shows a universal clip 50 having a flexibility permitting its use in a variety and mounting applications for the purpose of securing the batten assemblies to the building superstructure. The universal clip 50 is an elongated substantially L-shaped member having a first arm 51 provided with an elongated opening 52 and having a second arm 53 provided with a pair of elongated openings 54 and 55 which are offset from one another.

As shown in FIG. 5b, the universal clip 50 is secured to a horizontally aligned U-beam 56 by means of a bolt 57 and cooperating fastening nut 58 received by a suitable opening in beam 56 (not shown) and by the opening 52 provided in arm 51. The vertically aligned arm 53 receives the fastening member 17 through either one of the openings 54 or 55. This fastening member 17 not only secures the batten strips 12 and 13 to one another, but secures the entire assembly to the universal clip 50 and hence to the U-beam 56. For alignment purposes, the elongated openings 54 and 55 are offset relative to one another so that if either opening is too low or too high relative to the positioning of the batten assembly 10 or the other openings may be selected for mounting purposes. After selection of one opening and securely fastening the threaded member 17 the elongated openings 54 and 55 permit the interchange of normal expansion and contraction as between the beams 56 and the batten assemblies 10 so as to permit a certain amount of yielding under such pressures. In a like manner, the batten assembly 10 and the U-beam 56 may undergo expansion and contraction along its lengthwise dimensions which expansion and contractional interplay may be taken into account by virtue of elongated opening 52 and arm 51. Thus, in addition to providing a wide amount of tolerance for mounting, these elongated openings 54, 52 and 55, also allow for normal expansion and contractional changes in the structural components employed.

FIG. 5c shows an assembly in which the interior batten strip 12 is completed omitted and wherein the universal clip 50 provides both the function of securing the batten assembly to the U-beam 56 as well as performing the function of the interior batten strip 12. It should be understood that a suitable number of universal clips 50 should be positioned at spaced intervals along the length of the batten assembly to provide adequate support for the panel members.

FIG. 5d shows another mounting application for universal clip 50. The clip 50 which is preferably formed from a steel sheet of 1/8 inch thickness, may be bent so that its arm 51 curves about the upwardly directed arm 60 of a structural L-beam 61. After suitable bending of the clip 50 the clip may then be fastened to arm 60 of L-beam 61 by means of bolt 62 and a cooperating fastening nut 63. The arm 53 of clip 50 may then be secured
to the batten assembly 10 as shown in FIG. 5b, or may be substituted for the internal batten strip 12 in the manner shown in FIG. 5a.

FIG. 5c shows an alternative mounting structure where in the internal strip 12' is substantially similar to the batten strip 12 of FIGS. 1-4 with the exception of being provided with an inwardly directed projection 64 provided with elongated openings 65 arranged at spaced intervals along the projection 64 for the purpose of receiving the batten strip 12. Arm 63 is shown connected to an interior batten beam 10 as shown in FIGS. 5a and 5b. When required, the projection 64 may be bent downwardly in the manner in which arm 51 of clip 50 is bent, as shown in FIG. 5c, for the purpose of securing the interior batten strip 12' to an L-shaped beam 61. The openings allow for normal expansion and contraction of the batten members which may be dissimilar to the amount of expansion and contraction experienced by the supporting beams.

FIG. 6 shows a unitary batten assembly 70 which may be employed in applications requiring horizontal batten strips in a structural L-beam. 70 has a substantially H-shaped cross-sectional configuration and is comprised of a central portion 71 having a pair of downwardly depending arms 72 and 73 and a pair of upwardly aligned arms 74 and 75. The downwardly depending arms 72 and 73 receive the upper marginal edge of a panel member 76 which is aligned below the batten assembly 70 and may be supported at its lower end by a batten assembly similar in configuration to assembly 70. The upper arms 74 and 75 are provided with a pair of inwardly directed flanges 77 and 78, arranged along their interior surfaces for the purpose of supporting the lower edge of a panel member 79. A "weakening" groove 80 is provided along the interior surface of arm 74 just slightly below flange 77. In operation, the panel 79 is positioned between arms 74 and 75 so that its lower edge rests upon flanges 77 and 78. The weight of the panel member 79 upon the flange 77 weakens the supporting strength of arm 74 due to the presence of the weakening groove 80 and causes it to be pulled inwardly in the direction shown by arrow 81 to create an excellent force-fit between the vertex 82 of arm 74 and the inwardly directed flange 75a provided at the free end of arm 75. The vertex 82 lies between the outwardly flared portion 74a of arm 74 and the flat vertical surface 74b of arm 74. The outwardly flared portion 74a of arm 74 facilitates the insertion of the panel member 70 between arms 74 and 75. The front face of member 70 is provided with an elongated groove 75b which, in turn, is provided with a plurality of weep holes 75c arranged at spaced intervals within groove 75b to permit egress of any water or moisture which may accumulate along the internal surface of arm 74.

The one-piece batten assembly 70 is further provided with an inwardly directed projection 83 which has a plurality of elongated openings 84 (only one of which is shown) of the same type as shown in FIGS. 5a-5c for receiving fastening means 85 to secure the batten assembly to a structural L-beam 87.

In the case where it is desired to secure batten assembly 70 to a structural L-beam 87, shown in FIG. 6a, the projection 83 is notched or otherwise cut at two-foot intervals where in each notch is preferably three inches wide, to form a plurality of individual flanges or flaps which are then bent down against the upwardly directed arm 88 and secured thereto by suitable fastening members 89. The horizontal batten assembly 70 greatly simplifies handling and installation in that it is a one-piece member and provides excellent supporting strength for the panel members.

The lower interior arm 73 of the assembly 70 is provided with an inwardly tapered portion 73a and an inwardly directed projection 74 which cooperates with the inwardly directed projection 72a of arm 72 to provide a force-fit for the upper marginal edge of panel member 76. The tapered portion 73a of arm 73 provides sufficient clearance for a vertically aligned intersecting batten strip 90, the upper end of which is arranged to be concealed by the tapered edge 73a. The tapered edge 73a acts as a water shed to prevent the entry of water or moisture between vertical batten 90 and panel member 76. The upper exterior edge of the vertically aligned batten strip 90 is preferably tapered, as shown at 91, so as to facilitate its insertion between the panel member 76 and arm 73. Properly inserted, the intersecting vertical batten strip 90 enhances the force-fitting of the panel member 76 between the embracing arms of the one-piece batten assembly 70.

It can be seen from the foregoing that the instant invention provides novel batten assemblies for use in finishing building exteriors which are simple to handle, readily facilitate assembly thereof, and are sufficiently flexible to accommodate a variety of mounting applications, thereby greatly reducing material and assembly costs.

Although there has been described a preferred embodiment of this novel invention, many variations and modifications will now be apparent to those skilled in the art. Therefore, this invention is to be limited, not by the specific disclosure herein but only by the appended claims.

What is claimed is:

1. A batten assembly for mounting panel members to a building superstructure comprising:

- a first and second elongated batten strips each having a flat central portion for embracing the marginal edges of panel members therebetween;
- fastening means for rigidly securing said batten strips to one another;
- one or said batten strips being provided with an integrally formed substantially flat elongated projection extending toward the building superstructure for securement thereto;

said projection having apertures arranged at spaced intervals for the receipt of fastening members;

said projection being provided with a plurality of elongated notches arranged at spaced parallel intervals interspersing said apertures, said notches being aligned transverse to the length of said elongated projection to divide said elongated projection into a plurality of sections;

at least one of said projections being bent downwardly toward said central portion for securement to the vertically aligned structural members wherein said notches facilitate bending of said sections.

2. A batten assembly for mounting panel members to a building superstructure comprising a unitary member having a substantially H-shaped cross-section and having a central portion and a first and second pair of spaced substantially parallel arms depending respectively upwardly and downwardly from said central portion;

the upwardly aligned arms each having a flange arranged a spaced distance above said central portion for supporting the marginal edge of a panel member;

at least one of said upwardly projecting arms having a weakening groove aligned beneath its associated flange for weakening its associated arm under the weight of a panel member to provide a force-fit for the panel member between the first and second arms;

said central portions being provided with an integrally formed elongated mounting projection extending in the direction of the building superstructure for mounting thereto;

said projection having a plurality of apertures arranged at spaced intervals for the receipt of fastening means;

said projection being further provided with a plurality of elongated notches arranged at spaced parallel intervals and interspersed with said apertures, said notches being aligned transverse to the length of said projection to divide said projection into a plurality of sections;
at least one of said sections being bent downwardly toward said central portion for securement to the structural members wherein said notches facilitate bending of said sections.

3. The assembly of claim 3 wherein said downwardly depending arms are spaced apart by a distance sufficient to receive a panel member and one edge of an intersecting batten strip; the interior surface of the downwardly depending arm which is furthest removed from said superstructure being tapered to facilitate insertion of panel members and intersecting batten strips; the said one of said downwardly depending arms having said taper being further provided with a projection being positioned above said taper and along the interior surface of the arm and extending toward the remaining downwardly depending arm for abutting the upper edge of an inserted batten strip.

4. The assembly of claim 2 wherein one of said upwardly depending arms is provided with a plurality of weep holes arranged at spaced intervals along the length of the arm and adjacent the central portion to permit egress of any water which may collect upon the upper surface of the central portion.

5. The assembly of claim 3 wherein the taper provided on said one tapered arm is so arranged as to act as a water shed to prevent the entry of water behind said arm.

References Cited

UNITED STATES PATENTS

967,625 8/1910 Ferres 52—302
2,934,180 4/1960 Hammitt et al. 52—495
3,158,961 12/1964 Hawkins 52—395
3,214,888 11/1965 De Ridder 52—495
3,222,831 12/1965 Pritchard 52—99

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