

PATENT SPECIFICATION

(11)

1 581 375

1 581 375

- (21) Application No. 45103/77 (22) Filed 28 Oct. 1977 (19)
(31) Convention Application No. 51/146375U (32) Filed 30 Oct. 1976 in
(33) Japan (JP)
(44) Complete Specification Published 10 Dec. 1980
(51) INT. CL. ³ E04B 2/74 2/88
(52) Index at Acceptance
E1W JCM



(54) PANEL CONNECTORS

(71) We, YOSHIDA KOGYO K. K., a corporation duly organized under the laws of Japan and existing at No. 1, Kanda Izumi-cho, Chiyoda-ku, Tokyo, Japan, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:-

This invention relates to connectors, and more particularly to a connector assembly for connecting adjacent curtain wall units or panels edge to edge to assemble a curtain wall, a partition or the like.

The present invention seeks to provide a connector assembly which facilitates easy assemblage of a curtain wall or a partition construction.

The invention also seeks to provide a connector assembly which, as attached between curtain wall components or panels, has sufficient structural strength to transmit forces, from either jointed part to the other, either edgewise or facewise.

The invention further seeks to provide a connector assembly requiring only a small number of assembling parts.

According to the invention there is provided a panel connector comprising an elongate first member having two oppositely disposed elongate plug means extending therealong for securement in edge grooves of panels to be connected each plug means having a substantially U-shaped transverse cross section defined by a pair of spaced side walls projecting perpendicularly from the first member and terminating in a top wall extending between the pair of side walls, each of such two pairs of side walls having a corrugation extending longitudinally on and along its contacting exterior surface to firmly fit one of the first and second plug means in a corresponding one of the panel grooves and engagement means oppositely disposed on the first member extending

longitudinally thereof and facing substantially perpendicularly to the direction of said plug means and a pair of elongate second members each having a face for engagement with adjacent faces of panels to be interconnected and longitudinally extending means for retentive engagement with said engagement means of the first member.

The invention will now be described in greater detail, by way of example, with reference to the drawings, in which:-

Figure 1 is a front elevational view of a partition assembled by a plurality of connector assemblies each embodying the present invention; and

Figure 2 is a fragmentary, enlarged horizontal cross sectional view taken along line II-II of Figure 1, showing one of the connector assemblies; and

In the accompanying drawing, Figure 1 illustrates a partition 10 in which partition components or panels 11A, 11B, 11C and 11D are connected edge to edge by attaching connector assemblies, each designated by 12, between adjacent panels. The panels are made of a substantially rigid material, such as wood, metal, synthetic resin and the like.

Referring to Figure 2, the two adjacent panels 11A, 11B, are arranged edge to edge with a space or joint opening therebetween, and each has a groove 13, 14 extending longitudinally along and centrally of a jointing panel edge 15, 16.

Disposed centrally of the joint opening between the adjacent panels 11A, 11B is an elongated first member 17, which is made of a relatively rigid and slightly resilient material, such as extruded aluminium. This first member 17 is provided with a pair of first and second plug projections 18, 19 each having a substantially U-shaped transverse cross section defined by a pair of spaced side walls 20, 21 projecting perpendicularly from one side of the first member 17 and termi-

50

55

60

65

70

75

80

85

90

nating in a top wall 22 extending between the side walls 20,21, such two U-shape opening toward each other to provide a hollow substantially rectangular shape. Each of the pair of side walls 20,21 has a corrugation 23,24 extending longitudinally on and along its contacting exterior surface, thereby causing the first and second plug projections 18,19 to be firmly fitted in the respective panel grooves 13,14. Thus, the two adjacent panels 11A,11B are secured to each other through the first member 17.

The first member 17 is further provided on opposite sides with a pair of outwardly extending first and second socket means 25,26, respectively, which are disposed adjacent to opposite faces of the joint opening. Each of the first and second socket means 25,26 has a substantially U-shaped transverse cross section defined by a base portion 27,28 constituting one of opposite connecting portions of the afore-mentioned hollow rectangular shape and a pair of spaced arms 29,29 and 30,30 projecting perpendicularly and outwardly from opposite ends, as viewed in transverse cross section, of the base portion 27,28, and terminating in a pair of inwardly directed flanges 31,31 and 32,32, respectively.

Also shown in Figure 2 is a pair of elongated second members 33,34 each of which has a generally T-shaped transverse cross section defined by a base 35,36 covering the joint opening on its one face and a leg 37,38 projecting perpendicularly and inwardly from one side of the base 35, 36 and terminating in a lateral protuberance 39,40. Each of such two bases 35,36 is disposed against one sides of the adjacent panels. The legs 37,38 on the second members 33,34 are received in the first and second socket means 25,26, respectively, the protuberances 39,40 of the legs 37,38 being held by or in locking engagement with the respective pairs of the flanges 31,31 and 32,32 of the arms 29,29 and 30,30. The second members 33,34 are also made of a relatively rigid and slightly resilient material, such as extruded aluminium.

For assembly, the panel 11A is first fixed at its upper and lower ends to a stationary ceiling (not shown) and a stationary floor (not shown) of the building, respectively. Then, the first member 17 is applied to and moved toward the panel 11A in a direction parallel to the panel faces with a relatively great force, so that the first plug projections 18 is forced to insert into the panel groove 13. And, after the first member 17 has been fixed at its upper and lower ends on the stationary ceiling and the stationary floor, the panel 11B is applied to and moved toward the first member 17 in a direction parallel to the faces of the panel 11A with a relatively great force, so that the second

plug projection 19 is forced to insert into the panel groove 14. Lastly, after the panel 11B has been secured at its upper and lower ends to the stationary ceiling and the stationary floor, the second members 33,34 are applied to the joint opening on opposite faces to cover the same and forced to move toward each other simultaneously, or one after the other, in the directions perpendicular to panel faces, with a relatively great force, until the legs 37,38 on the second members 33,34 are held by or come into locking engagement with the respective pairs of the arms 29,29 and 30,30.

For removal of either one or both of the jointed panels 11A,11B for replacement, it is sufficient if the panel or panels to be moved are forced to move apart from the first member 17, in the direction parallel to the panel faces, with a relatively great force, against frictional resistances between the contacting surfaces of the panel grooves 13,14 and those of the plug projections 18,19.

Instead of providing the socket means 25, 26 on the first member 17 and the legs 37, 38 with protuberances 39, 40 on the second members 33, 34 the opposite configuration with the socket means on the second member and legs on the first member can be employed.

WHAT WE CLAIM IS:-

1. A panel connector comprising an elongate first member having two oppositely disposed elongate plug means extending therealong for securement in edge grooves of panels to be connected each plug means having a substantially U-shaped transverse cross section defined by a pair of spaced side walls projecting perpendicularly from the first member and terminating in a top wall extending between the pair of side walls, each of such two pairs of side walls having a corrugation extending longitudinally on and along its contacting exterior surface to firmly fit one of the first and second plug means in a corresponding one of the panel grooves and engagement means oppositely disposed on the first member extending longitudinally thereof and facing substantially perpendicularly to the direction of said plug means and a pair of elongate second members each having a face for engagement with adjacent faces of panels to be interconnected and longitudinally extending means for retentive engagement with said engagement means of the first member.

2. A connector according to claim 1, wherein the engagement means comprise two elongate socket means disposed adjacent to opposite faces of the joint opening and the pair of elongate second members each have a generally T-shaped transverse cross section with the leg projecting inwardly into the socket means.



11
nating in a top wall 22 extending between the side walls 20,21, such two U-shape opening toward each other to provide a hollow substantially rectangular shape. Each of the pair of side walls 20,21 has a corrugation 23,24 extending longitudinally on and along its contacting exterior surface, thereby causing the first and second plug projections 18,19 to be firmly fitted in the respective panel grooves 13,14. Thus, the two adjacent panels 11A,11B are secured to each other through the first member 17.

The first member 17 is further provided on opposite sides with a pair of outwardly extending first and second socket means 25,26, respectively, which are disposed adjacent to opposite faces of the joint opening. Each of the first and second socket means 25,26 has a substantially U-shaped transverse cross section defined by a base portion 27,28 constituting one of opposite connecting portions of the afore-mentioned hollow rectangular shape and a pair of spaced arms 29,29 and 30,30 projecting perpendicularly and outwardly from opposite ends, as viewed in transverse cross section, of the base portion 27,28, and terminating in a pair of inwardly directed flanges 31,31 and 32,32, respectively.

Also shown in Figure 2 is a pair of elongated second members 33,34 each of which has a generally T-shaped transverse cross section defined by a base 35,36 covering the joint opening on its one face and a leg 37,38 projecting perpendicularly and inwardly from one side of the base 35, 36 and terminating in a lateral protuberance 39,40. Each of such two bases 35,36 is disposed against one sides of the adjacent panels. The legs 37,38 on the second members 33,34 are received in the first and second socket means 25,26, respectively. the protuberances 39,40 of the legs 37,38 being held by or in locking engagement with the respective pairs of the flanges 31,31 and 32,32 of the arms 29,29 and 30,30. The second members 33,34 are also made of a relatively rigid and slightly resilient material, such as extruded aluminium.

For assembly, the panel 11A is first fixed at its upper and lower ends to a stationary ceiling (not shown) and a stationary floor (not shown) of the building, respectively. Then, the first member 17 is applied to and moved toward the panel 11A in a direction parallel to the panel faces with a relatively great force, so that the first plug projections 18 is forced to insert into the panel groove 13. And, after the first member 17 has been fixed at its upper and lower ends on the stationary ceiling and the stationary floor, the panel 11B is applied to and moved toward the first member 17 in a direction parallel to the faces of the panel 11A with a relatively great force, so that the second

plug projection 19 is forced to insert into the panel groove 14. Lastly, after the panel 11B has been secured at its upper and lower ends to the stationary ceiling and the stationary floor, the second members 33,34 are applied to the joint opening on opposite faces to cover the same and forced to move toward each other simultaneously, or one after the other, in the directions perpendicular to panel faces, with a relatively great force, until the legs 37,38 on the second members 33,34 are held by or come into locking engagement with the respective pairs of the arms 29,29 and 30,30.

For removal of either one or both of the jointed panels 11A,11B for replacement, it is sufficient if the panel or panels to be moved are forced to move apart from the first member 17, in the direction parallel to the panel faces, with a relatively great force, against frictional resistances between the contacting surfaces of the panel grooves 13,14 and those of the plug projections 18,19.

Instead of providing the socket means 25, 26 on the first member 17 and the legs 37, 38 with protuberances 39, 40 on the second members 33, 34 the opposite configuration with the socket means on the second member and legs on the first member can be employed.

WHAT WE CLAIM IS:-

1. A panel connector comprising an elongate first member having two oppositely disposed elongate plug means extending therealong for securement in edge grooves of panels to be connected each plug means having a substantially U-shaped transverse cross section defined by a pair of spaced side walls projecting perpendicularly from the first member and terminating in a top wall extending between the pair of side walls, each of such two pairs of side walls having a corrugation extending longitudinally on and along its contacting exterior surface to firmly fit one of the first and second plug means in a corresponding one of the panel grooves and engagement means oppositely disposed on the first member extending longitudinally thereof and facing substantially perpendicularly to the direction of said plug means and a pair of elongate second members each having a face for engagement with adjacent faces of panels to be interconnected and longitudinally extending means for retentive engagement with said engagement means of the first member.

2. A connector according to claim 1, wherein the engagement means comprise two elongate socket means disposed adjacent to opposite faces of the joint opening and the pair of elongate second members each have a generally T-shaped transverse cross section with the leg projecting inwardly into the socket means.

12

3. A connector according to claim 2,
each of the socket means have a substantial-
ly U-shaped transverse cross section defined
by a base portion carried by said first
5 member and a pair of spaced arms project-
ing outwardly and perpendicularly from
opposite ends, as viewed in transverse cross
section, of said base portion, and terminat-
ing in a pair of inwardly directed flanges,
10 respectively, each of the legs of the second
members terminating in a lateral protuber-
ance engaging one pair of such two pairs of
flanges.

4. A connector according to any one of
15 claims 1 to 3, wherein two U-shaped cross
sections are provided open toward each
other to provide a hollow, substantially
rectangular shape.

5. A panel connector substantially as
20 herein described with reference to the draw-
ings.

25 For the Applicants,
J.F. WILLIAMS & CO.,
Chartered Patent Agents,
34 Tavistock Street,
London WC2.

Printed for Her Majesty's Stationery Office,
by Croydon Printing Company Limited, Croydon, Surrey, 1980.
Published by The Patent Office, 25 Southampton Buildings,
London, WC2A 1AY, from which copies may be obtained.



* C L M S *