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WALL CONSTRUCTION ASSEMBLY

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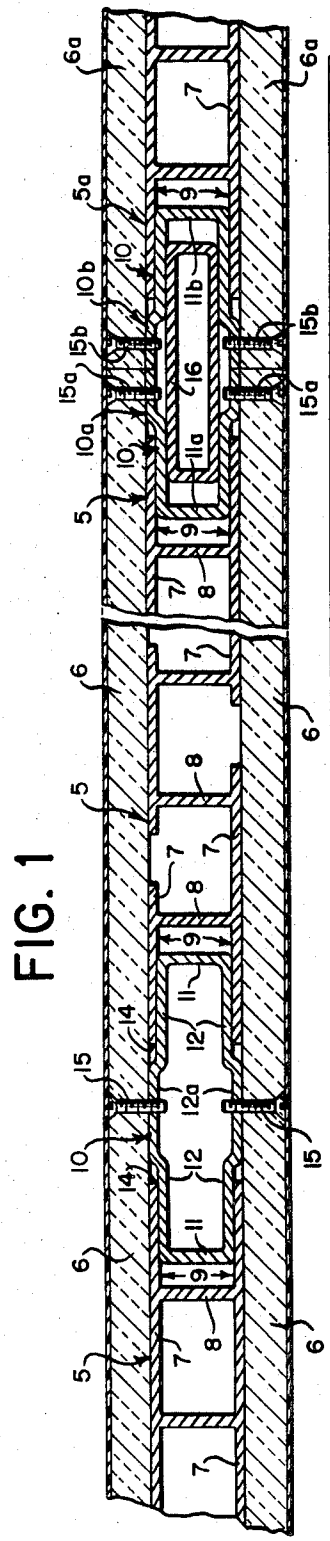


FIG. 1

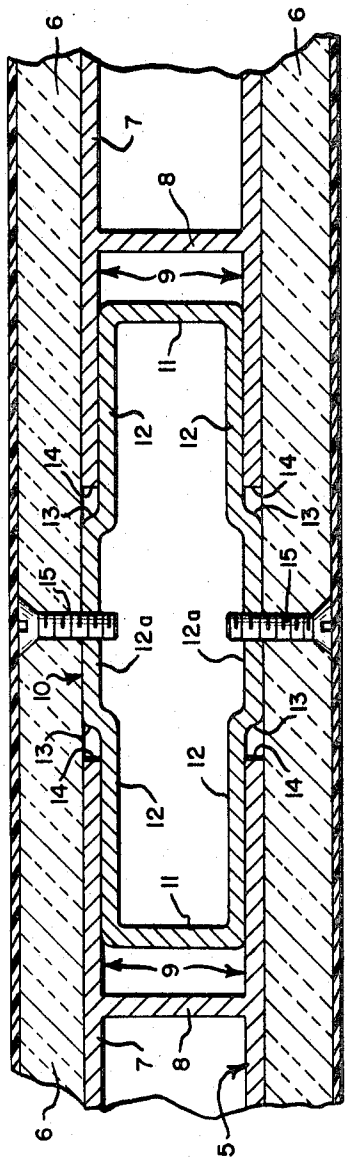


FIG. 2

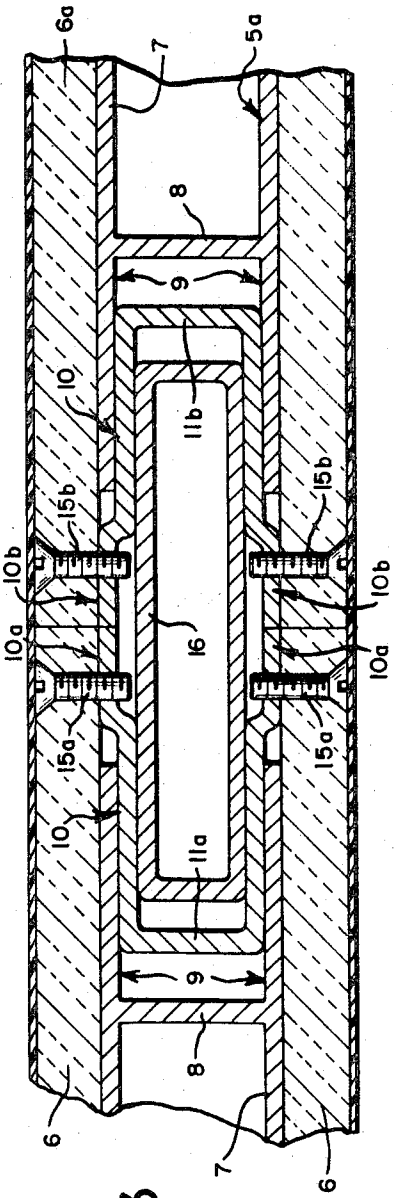


FIG. 3

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WALL CONSTRUCTION ASSEMBLY

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ABSTRACT OF THE DISCLOSURE

A wall construction assembly comprising at least two extruded metal panel sections having spaced parallel skin members, an extruded metal joiner tube the side portion of which lie partially within the channel-shaped longitudinal edges of the panels and having outwardly displaced central portions adapted to lie in the plane of the skin members, and a fire-resistant panel positioned adjacent each skin member of the wall panel sections and secured to the outwardly displaced central portions of the joiner tube to permit expansion of the metal panel sections independently of the fire-resistant panels.

This invention relates to a building wall construction assembly and, more particularly, to such a wall assembly composed of extruded metal structural members and fire-resistant surface members.

Wall construction assemblies have been produced heretofore of extruded metal panel components interconnected by joiner tubes or chines and covered on their wall surface with sheet-like panels of fire-resistant material bonded or otherwise secured to the walls of the panels. It has been found, however, that the thermal expansion of the metal panel components so exceeds that of the fire-resistant panels as to cause buckling of the fire-resistant panels when they are initially installed, as required by fire regulations, with negligible spacing between adjacent edges of the fire-resistant panels.

I have now devised a wall construction assembly composed essentially of such extruded metal parts and superposed fire-resistant panels which permits a permanently cloes fit between adjacent edges of the fire-resistant panels without buckling due to thermal expansion or contraction of the underlying supporting structure of panels and joining members. The wall construction assembly of the present invention comprises at least two extruded metal wall panel sections and an extruded metal joiner tube. Each of the panel sections comprises two parallel skin members integrally connected in spaced relationship by a plurality of web members positioned at longitudinally spaced intervals transversely between the skin members with the skin members extending beyond the endmost web members of each panel section to form therewith a channel-shaped longitudinal edge portion. Each of the joiner tubes comprises an elongated tube having a first pair of parallel spaced side walls and a second pair of parallel spaced side walls normal to the first pair, each of the side walls of the second pair thereof having a central portion outwardly offset from the other portions thereof by a shoulder portion substantially normal to the plane of the other portions of said second pair of side walls and having a depth substantially equal to the thickness of the channel-forming extensions of the wall panel section skin members, the two central portions being parallel to one another. The wall panel sections are assembled with the two end portions of the joiner tube adjacent the first pair of spaced side walls inserted in and frictionally engaging the channel-shaped longitudinal edge portions of adjoining wall panel sections with the extremities of the extending side wall skin members terminating short of the proximate shoulder portions of

the joiner tube and with the first pair of joiner tube side walls spaced from their respective proximate endmost web members of the adjacent wall panel sections. The assembly is completed by a fire-resistant panel positioned parallel to and susbtantially in contact with each panel section skin member and coextensive with a plurality of the wall panel sections, the fire-resistant panel being secured to the underlying central offset portion of each joiner tube interconnecting the aforesaid plurality of wall panel sections.

These and other novel features of the wall construction assembly of the present invention will be readily apparent from the following discussion taken in conjunction with the accompanying drawings in which

FIG. 1 is a sectional view of a wall construction assembly embodying the invention;

FIG. 2 is an enlarged section of the joint between adjacent panel sections shown in FIG. 1; and

FIG. 3 is an enlarged section of the joint between adjacent wall panel assemblies embodying the invention.

The wall construction assembly shown in FIG. 1 comprises a plurality of wall panel sections 5 of extruded metal, such as aluminum or aluminum alloy, covered on one or both sides with a sheet of fire-resistant material 6, such as asbestos sheet board or the like. In the drawing, the wall panel sections marked 5 comprise part of a single wall panel made up of a plurality of sections covered with a single sheet of fire-resistant material marked 6, whereas the wall section marked 5*a* and the sheet of fire-resistant material marked 6*a* are components of a second and similar wall panel joined along one of its longitudinal edges to a longitudinal edge of the first-mentioned panel.

The extruded wall panel sections 5 and 5*a* are of well-known construction consisting of two parallel skin members 7 connected in spaced relationship by a plurality of web members 8 positioned at longitudinally spaced intervals transversely between the skin members. The two skin members of each panel section can be continuous for maximum rigidity or can be discontinuous for minimum weight where rigidity is not as important, and both types can be incorporated in a single panel as shown in FIG. 1. Along the longitudinal edges of each wall panel section, the skin members extend beyond the endmost web member to form therewith a channel-shaped longitudinal edge portion 9.

Adjacent wall panel sections forming components of a single panel are interconnected along their channel-shaped longitudinal edge portions 9 by a frictionally held but floating joiner tube 10 shown in the left half of FIG. 1 and in detail in FIG. 2. The joiner tube is extruded, advantageously of the same metal as the wall panel sections, and has a first pair of parallel spaced side walls 11 and a second pair of parallel spaced side walls 12 normal to the first pair. Each of the side walls 12 is provided with a central portion 12*a* which is outwardly offset from the end portions of the side walls 12 by a shoulder portion 13 substantially normal to the planes of the end portions and offset central portions of the side wall 12. The depth of the shoulder 13 is substantially equal to the thickness of the channel-forming extensions of the wall panel section skin members 7.

The adjacent wall panel sections 5 of each panel are assembled with the two end portions of the joiner tube adjacent the first pair of spaced side walls 11 inserted in and frictionally engaging the channel-shaped longitudinal edge portion 9 of the adjacent panel sections. The extremities 14 of the extruded side wall skin members terminate short of the proximate shoulder portions 13 of the joiner tube, and the first pair of joiner tube side walls 11 are spaced from their respective proximate endmost web members 8 of the adjacent panel sections. Thus,

the joiner tube, except for its frictional engagement by the channel-shaped edge portions **9**, is free to move in and out of the channel-shaped edge portions by a significant distance without the shoulder portions **13** simultaneously abutting the extremities of the skin members **7** of the adjacent wall panel sections.

The outermost fire-resistant panels **6** are positioned parallel to and substantially in contact with each wall panel skin member **7**. These outer panels **6** are coextensive with a plurality of wall panel sections **5** and are held in place by being secured, as by a screw **15**, to the underlying central offset portion of each joiner tube **10** interconnecting the plurality of wall panel sections with which the outer panel **6** is coextensive. Thus, the outermost panels **6** are anchored in place only at the floating joiner tubes so that the metal wall panel sections **5** can expand or contract under varying temperature conditions without causing buckling or other distortion of the assembly.

Adjacent wall assemblies are advantageously joined together in the manner shown in the right half of FIG. 1, and in more detail in FIG. 3, to permit relative movement of one assembly with respect to the other without distorting or disrupting the outer panels of fire-resistant material. As shown in these drawings, the longitudinal edges of adjacent panel assemblies engage two complementary halves **10***a* and **10***b* of a joiner tube **10** which can be extruded as such or obtained by cutting a joiner tube **10** in half lengthwise. The two half-tubes **10***a* and **10***b* are frictionally joined by an inner joiner tube **16** of substantially oblong cross-section, the width of the tube **16** across the joint being substantially less than the distance between the opposite side walls **11***a* and **11***b* of the two half-tubes. The extremities of the adjacent outer panels **6** are secured to their respective proximate half-tubes **10***a* and **10***b* by suitable means, such as screws **15***a* and **15***b*. Thus, the extremities of the outer fire-resistant panels are secured to the floating half-tubes **10***a* and **10***b* which, in turn are slidably held in place by their frictional engagement with the inner joiner tube **16**.

It will be seen, accordingly, that the wall construction assembly of the present invention makes possible the installation of fire-protection panels rigidly supported by an internal extruded metal assembly which is capable of moving within the fire-protective panels as the metal assembly expands or contracts but without distorting the outer panel arrangement and without causing the abutting outer protective panels to become separated from one another. It will be further understood that an additional protective or decorative panel or covering, such as metal foil laminate or plastic sheet, can be applied over either or both of the fire-protective panels **16**.

I claim:

1. A wall construction assembly comprising at least two extruded metal wall panel sections and an extruded metal joiner tube,

(a) each of the panel sections comprising two parallel skin members integrally connected in spaced relationship by a plurality of web members positioned at longitudinally spaced intervals transversely between the skin members, the skin members extending beyond the endmost web members of each panel section to form therewith a channel-shaped longitudinal edge portion,

(b) each of the joiner tubes comprising an elongated tube having a first pair of parallel spaced side walls and a second pair of parallel spaced side walls normal to the first pair, each of the side walls of the second pair thereof having a central portion outwardly offset from the other portions thereof by a shoulder portion substantially normal to the plane of the other portions of said second pair of side walls and having a depth substantially equal to the thickness of the channel-forming extensions of the wall panel section skin members, the two central portions being parallel to one another,

(c) the wall panel sections being assembled with the two end portions of the joiner tube adjacent the first pair of spaced side walls inserted in and frictionally engaging the channel-shaped longitudinal edge portions of adjoining wall panel sections with the extremities of the extending side wall skin members terminating short of the proximate shoulder portions of the joiner tube and with the first pair of joiner tube side walls spaced from their respective proximate endmost web members of the adjacent wall panel sections,

(d) a fire-resistant panel being positioned parallel to and substantially in contact with each wall panel section skin member and coextensive with a plurality of the wall panel sections, the fire-resistant panel being secured to the underlying central offset portion of each joiner tube interconnecting said plurality of wall panel sections.

2. A wall construction comprising at least two of the assemblies defined in claim **1** and joined

(a) by a joiner tube according to claim **1** but separated into two separate complementary portions by division lengthwise and medially of the central offset portion thereof,

(b) by an oblong cross-sectional joiner tube two side walls of which are frictionally positioned within the complementary portion of the first-mentioned joiner tube and the other two side walls of which are spaced from the proximate parallel first pair of side walls of the first-mentioned joiner tube,

(c) the edge portions of the adjacent fire-resistant panels on a common side of the joined assemblies being secured to the proximate underlying separate complementary portions of the first-mentioned joiner tube.

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