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PREFABRICATED BUILDING WALL CONSTRUCTION

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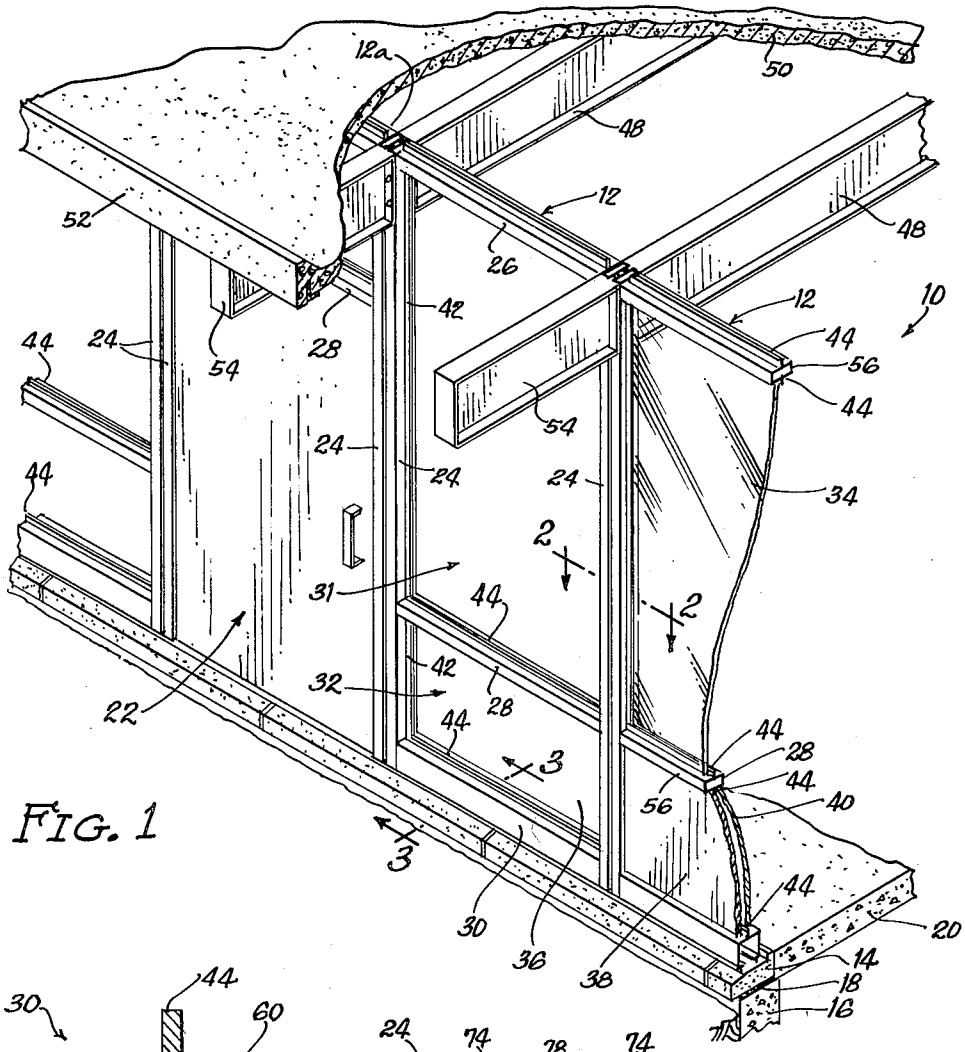


FIG. 1

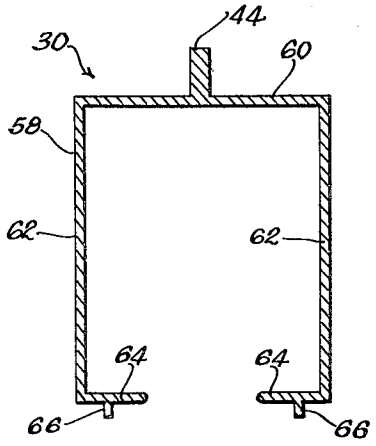


FIG. 3

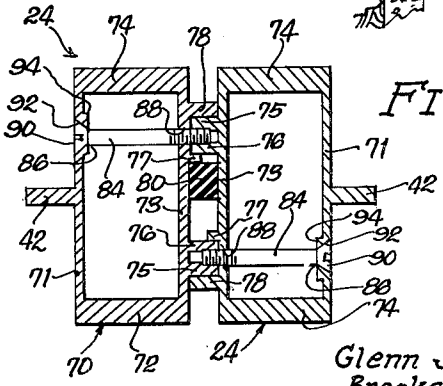


FIG. 2

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PREFABRICATED BUILDING WALL CONSTRUCTION

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1 Claim. (Cl. 189—34)

This invention relates to the construction of buildings and pertains particularly to a prefabricated building wall construction.

One object of the present invention is to provide a new and improved building wall which comprises prefabricated frames having side members formed with pairs of laterally projecting fins to facilitate the formation of secure and weathertight joints between the engaging side members of adjacent frames.

A further object is to provide a new and improved construction of the foregoing character in which each side member is provided with a pair of closely spaced fins and a pair of widely spaced fins, so arranged that the closely spaced fins on one side member are received between the widely spaced fins on the adjacent side member, to form a tight joint between the frames.

Another object is to provide a new and improved construction of the foregoing character, in which the adjacent frames may be secured together by means of bolts which extend between and are threadedly engaged with the closely spaced fins.

A further object is to provide a new and improved construction of the foregoing character in which the finned side members may readily be formed at low cost by extruding them from aluminum material.

Further objects and advantages of the present invention will appear from the following description, taken with the accompanying drawings, in which:

FIG. 1 is a fragmentary perspective view showing a prefabricated building wall to be described as an illustrative embodiment of the present invention.

FIG. 2 is a horizontal section, taken generally along a line 2—2 in FIG. 1, through the side members employed in the frames of the building wall.

FIG. 3 is a vertical section, taken generally along a line 3—3 in FIG. 1, through the bottom cross member of one of the frames

It will be seen that FIG. 1 illustrates a prefabricated building wall which is of the general type illustrated, described and claimed in our copending applications, Serial No. 768,108, filed October 20, 1958, and Serial No. 46,-019, filed July 28, 1960. Thus, the illustrated building wall **10** comprises a plurality of prefabricated, generally rectangular frames **12** which are erected edge to edge on a sill **14** made of stone or other suitable material. In this case, the sill **14** is made in sections which are mounted on a concrete foundation or footing **16**. A bed of mortar **18** may be employed between the sill **14** and the foundation **16**. Within the building, a concrete floor **20** may be poured so as to be level with the upper edge of the sill **14**. A special frame **12***a* may be provided to receive a door **22**.

It will be seen that each of the rectangular frames **12** comprises a pair of spaced vertical side members **24**. A plurality of horizontal cross members extend between the side members **24** and are welded or otherwise secured to the side members so that the frames will be extremely rigid. It will be seen that each of the illustrated frames **12** is formed with three cross members **26**, **28** and **30**. The cross member **26** extends across the top of the frame **12**, between the upper ends of the side members **24**. The member **30** extends across the bottom of the frame **12**,

between the lower ends of the side members **24**. It will be seen that the member **28** extends between the side members **24** at an intermediate point so as to form upper and lower openings **31** and **32** in the frame **12**. As shown, the openings **31** and **32** may be closed with panels of various kinds. Thus, a glass panel **34** may be mounted in the opening **31** to provide a window. In some of the frames, a glass panel **36** may also be mounted in the lower opening **32**. However, in other frames, the lower opening **32** may be closed by an exterior closure panel **38** made of a suitable material, such as stone, metal, or the like. On the inside of the wall, an interior wall panel **40** may be mounted in the opening **32**. The panel **40** may be made of any suitable interior wall material, such as insulating board, plaster board, plywood or the like.

Each of the vertical side members **24** has a fin or flange **42** thereon which projects into the openings **31** and **32** defined by the frame. The various closure panels **34**, **36**, **38** and **40** may be mounted against the fins **42**. It will be seen that the fins **42** extend longitudinally along the side members **24**. Similar fins **44** are formed on the cross members **26**, **28** and **30**.

The intermediate cross member **28** may be disposed at any suitable height in the frame. In the case of the door frame **12***a*, the cross member **28** is at a height corresponding to the top of the door **22**. It will be seen that the bottom cross member is omitted in the case of the door frame **12***a*.

The adjacent side members **24** of the adjacent frames **12** are engaged with each other and are securely fastened together, so as to unite the frames into a rigid wall. The united side members **24** act as load-bearing columns to support the weight imposed upon the building wall **10**. Thus, the frames **12** not only close the wall, but also bear any load imposed on the wall, without the need for additional columns of any kind. This arrangement makes it possible to construct a building very economically.

It will be seen that roof or ceiling beams **48** may be bolted or otherwise secured to the side members **24**, so that the weight borne by the beams will be carried by the side members. A roof deck **50** may be mounted on the beams **48**. As shown, the roof **50** has an outwardly overhanging portion **52** supported by outwardly extending sections **54** of the beams **48**.

The upper cross member **26** and the intermediate cross member **28** may be similar in cross section and may comprise a hollow rectangular body portion **56**. The fins **44** may project upwardly and downwardly from the body **56**.

The bottom cross member **30** comprises a hollow body section **58** which is generally in the form of an inverted channel. Thus, the body **58** has a horizontal top wall **60**, with vertical side walls or flanges **62** projecting downwardly therefrom. The fin **44** extends upwardly from the top wall **60**. Horizontal flanges **64** project inwardly from the lower edges of the side walls **62**. In this case, longitudinal fins **66** project downwardly from the flanges **64** and are adapted to engage the upper surface of the stone sill **14**.

The cross members **26**, **28** and **30** may be made of extruded aluminum or other suitable material. The same is true of the side members **24**. Extruded aluminum has the advantages of being economical, easy to form, corrosion resistant, and extremely light in weight.

As shown to advantage in FIG. 2, each of the side members **24** has a hollow tubular body **70** which is rectangular in cross section. The body **70** may be extruded in one piece from aluminum or other suitable material.

Thus, the body **70** of the side member **24** has four walls **71**, **72**, **73** and **74**. The walls **72** and **74** face toward the inside and the outside of the building, while the walls **71** and **73** face laterally along the line of the wall. It

will be seen that the panel-supporting fin **42** projects laterally from the wall **71**.

To assist in forming the joints between the frames **12**, each of the side members **24** has a pair of closely spaced fins **75** and **76**, and a pair of widely spaced fins **77** and **78**. These fins extend longitudinally along the side member and project laterally from the wall **73**. The closely spaced fins **75** and **76** are staggered relative to the widely spaced fins **77** and **78** so that the closely spaced fins on one side member will be received between the widely spaced fins on the adjacent side member of the adjacent frame. Thus, the spacing between the widely spaced fins **77** and **78** corresponds to the total distance spanned by the closely spaced fins **75** and **76**. This arrangement provides an extremely snug and weather-tight joint between the adjacent side members **24**. The height of the fins **75**, **76** and **78** is substantially the same so that the outer edges of these fins will engage the side wall **73** of the adjacent side member. In the illustrated construction, the height of the fin **77** is less than that of the fins **75**, **76** and **78**. A still tighter joint may be formed between the frames **12** by inserting a soft gasket or sealing strip **80** between the walls **73** of the adjacent side members **24**. The sealing strip **80** may be made of synthetic rubber or other suitable material. As shown, the sealing strip **80** is mounted between the fins **76** and **77** of one of the side members so as to be concealed from view.

The interlocking arrangement of the fins **75**, **76**, **77** and **78** provides many engaging surfaces to exclude wind and rain from the joint between the frames. Moreover, the interlocking fins hold the side members **24** against any inward or outward shifting movement.

The frames **12** may be securely fastened together by means of bolts **84**. In this case, each of the bolts **84** extends through openings **86** and **88** in the lateral walls **71** and **73** of one of the adjacent side members **24**. The inner end of the bolt extends between and is threadedly engaged with the closely spaced fins **75** and **76**. The bolt **84** may be of the self-tapping type, so that it will form its own threads on the fins **75** and **76** as the bolt is screwed between the fins. It will be apparent that the fins **75** and **76** act as nut members adapted to receive the self-tapping bolt **84** and extending the full length of the side member **24**.

The illustrated bolt **84** has a flat head **90** which is counter-sunk into an opening **92** around the hole **86**. The wall **71** has a boss portion **94** of increased thickness so that the counter-sunk opening **92** may be formed without weakening the wall. The boss portion **94** is of substantially greater thickness than the remainder of the wall **71**. The boss portion **94** may extend longitudinally along the entire length of the side member **24**. Thus,

the bolt **84** may be located at any desired position along the length of the side member. The boss **94** provides continuous reinforcement, while the fins **75** and **76** provide a continuous nut member along the entire length of the side member **24**.

It will be apparent that the prefabricated frames **12** may be manufactured very readily and at low cost. Moreover, the frames may be assembled very easily and quickly to form the completed building wall. Very little labor is required to assemble the frames, so that the erection of the wall is inexpensive. The construction of the frames assures that the joints between the frames will be snug and weathertight.

Various modifications, alternative constructions and equivalents may be employed without departing from the true spirit and scope of the invention, as exemplified in the foregoing description and defined in the following claim.

We claim:

In a building wall construction, the combination comprising a pair of adjacent elongated structural members, each of said members being hollow and generally rectangular in cross section, each of said members having four parallel fins projecting laterally therefrom and extending longitudinally therealong, said fins projecting toward the adjacent member of said pair, said four fins on each structural member being grouped into a first pair of fins and a second pair of fins with a substantial interval between said first and second pairs of fins, the spacing between the fins of said second pair being relatively wide and corresponding to the total distance spanned by the fins of said first pair, the first pair of fins on each member being received between the second pair of fins on the adjacent member to form snug joints therebetween, a soft resilient gasket compressed between the adjacent structural members and disposed in the interval between said pairs of fins, said structural members having bolt holes extending therethrough and disposed substantially midway between said fins of said second pair, and self-tapping threaded bolts extending through said bolt holes and threadedly tapped between the fins of the first pair on each structural member, each bolt tapping its own threads on the corresponding first pair of fins.

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