FRAMING MEMBER AND PANEL STOP FOR ACCOMMODATING PANELS OF VARIOUS THICKNESSES

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The present invention relates to a building wall construction, and, more particularly, to a novel frame and panel construction and to a new and improved framing member provided with improved panel stop means. The framing member according to the present invention is particularly useful in fabricating building walls and wall frames, or in securing panel members in the frames.

Because of its many advantages over other types of building construction, the curtain wall type of building construction has been widely used in recent years. Metallic members of the curtain wall forms frames which retain panels such as glass glazing and the like. For various reasons it is frequently necessary to use panels of different thicknesses. Frequently, it has been necessary to provide a large number of differently shaped and dimensioned members which are ordinarily used in the fabrication of one building in order to provide for the accommodation of panels of various thicknesses. In order to reduce the number of different types of parts which must be provided, it would be desirable to minimize the number of differently shaped structural members which are needed, while at the same time providing for the accommodation of various size panel thicknesses.

Additionally, in many of the prior known panel glazing systems, difficulty has been experienced in attaching panel or glass stops in securing or interlocking the stop with the frame member. Consequently, it would be desirable to provide a panel or glass stop which can readily be interworked with a framing member without the exposure of screws or other fastening devices.

An object of the present invention is to provide a new and improved building wall construction having the above-mentioned advantages.

A further object of the present invention is to provide a new and improved metal frame structure.

Yet a further object of the present invention is to provide a new and improved metal frame structure which is readily adaptable to receive a plurality of various size panel thicknesses.

Yet a further object of the present invention is the provision of a metal frame structure of the type employing a frame member and a panel stop and which provides more readily for the interlocking of the panel stop with the frame member.

Further objects and advantages of the present invention will become apparent as the following description proceeds and the features of novelty which characterize the invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

In accordance with these and many other objects of the present invention, there is provided a new and improved building wall construction utilizing a novel framing member and a novel panel stop. More specifically, the framing member, according to the present invention, is a unitary element comprising in cross section a jamb surface with a depression defined therein. The depression in the jamb surface includes a pair of end leg portions and a bottom portion. Most of the plurality of intermediate leg portions are provided in the depression. One of the end leg portions and the intermediate leg portions are provided with toe portions coplanar with the jamb surface which form lips extending toward the other end leg portion and the toe portions define a camming surface on their inner surface which faces the second end leg portion and which is inclined downwardly toward the second end leg portion.

Additionally, in accordance with the present invention, a novel panel or glass stop member is provided for interlocking engagement with the framing member. More specifically, the panel stop member is of open inverted cross section having first and second legs. In one embodiment, the panel stop member is of generally inverted U-shape. In another embodiment, the panel stop member is illustrated as being of somewhat V-shaped inverted cross section. One of the legs is provided with a toe portion forming a lip extending toward the other leg, and the surface of the toe portion which faces the other leg defines a camming surface inclined upwardly toward the second leg and adapted to cam over the camming surface of the leg portions of the framing member and to snap over the toe portions of the framing member. The toe portion of the glass stop in this manner will extend into the depression of the framing member and interlockingly engage with a selected one of the leg portions of the framing member. The second leg of the glass stop has an end, spaced apart from the first end of the first leg, and seated on the jamb surface of the framing member.

It will be appreciated that by proper dimensioning of the width of the jamb surface, and the spacing of the first and intermediate leg portions, and by dimensioning of the spacing of the ends of the legs on the glass stop, that the glass stop may selectively be used with a number of different ones of the leg portions on the framing member to provide for various thicknesses of panel elements. Additionally, various glass stops may be provided wherein the end legs have various spacings to adapt the glass stops for use with various ones of the leg portions of the framing member.

It will further be appreciated that advantageously the above-described structure provides for the easy and ready snapping of the glass stop by first placing one leg of the glass stop on the jamb surface, and then forcing the other leg of the glass stop, which is the leg provided with the toe portion, over the camming surfaces of the respective toe portions to interlock the glass stop with a selected one of the leg portions of the framing member. By the pivotal rotation of the glass stop about its line of engagement with the jamb surface, over-center travel of the glass stop toward the panel element is minimized providing for quick and easy assembly and retention of a panel in the frame structure.

According to yet another feature of the present invention, the framing member is provided with means along its longitudinal edges for interfitting with a complementary framing member of similar configuration. In this manner there is provided a split frame structure, or mullion, so that if desired panels of the building wall construction may be prefabricated prior to their erection into place, and additionally to make some provision for the expansion of the metallic elements.

For a better understanding of the present invention, reference may be had to the accompanying drawings, wherein:

FIG. 1 is a fragmentary isometric view of a building wall construction according to the present invention;

FIG. 2 is an end view of one of the frame structures illustrated in FIG. 1;

FIG. 3 is an end view of another of the frame structures illustrated in FIG. 1;

FIG. 4 is an exploded, fragmentary view of the frame structure of FIG. 3, illustrating the depression in the frame member and the glass stop.
In accordance with the present invention, there is provided a building wall structure, as illustrated in FIG. 1, and including a split mullion or frame member 10 supporting on one side a thin panel 11, here shown of glass, and supporting a thicker panel 12 on the other side.

The split mullion 10, according to the present invention, is formed of a pair of intersected extruded unitary metal framing members 10a and 10b, which contain complemental notches along their longitudinal edges for interfitting the framing members together to provide the split mullion 10. More specifically, the framing members 10a and 10b are provided with respective jamb surfaces 13a, 13b and 14a, 14b. The jamb surfaces 13a, 13b and 14a, 14b are separated by respective shallow channel-shaped depressions 15a, 15b intermediate the transverse ends of the framing members 10a and 10b. Additionally, the framing member 10a is provided adjacent its longitudinal edges with a pair of offset tongues 16 and 17 and the framing member 10b is provided with parts along its longitudinal edges forming complementary grooves 20 and 21 to receive the tongues 16 and 17. Sealing gaskets 22 are provided on the tongues 16 and 17 to provide for weatherproofing the tongue-and-groove connection between the framing members 10a and 10b, and to allow for limited transverse movement of the framing members toward and away from each other to accommodate expansion and contraction of the wall structure. The gaskets 22 may be of the type described and claimed in the copending application Ser. No. 142,242, filed Oct. 2, 1961, now abandoned, a division of U.S. Patent No. 3,037,591, granted June 5, 1962.

To provide a first stop for the panels 11 or 12, the depressions 15a and 15b of the respective framing members 10a and 10b are defined by a first end leg 24a, 24b and a second end leg 25a, 25b, respectively. The second end leg extends upwardly from the depression above the jamb surfaces 14a, 14b and is provided with a slitlike sealing groove 26a adjacent its outer end which retains a respective sealing gasket 27. The depressions 15a, 15b are additionally defined by a bottom wall or bight portion 30a, 30b.

In order to provide for means selectively to accommodate various thicknesses of panel members, a plurality of intermediate legs 31a, 31b, 32a, and 32b are provided in the depression 15a, 15b, extending upwardly from the bight portion 30a, 30b. The first end legs 24a, 24b and the intermediate legs 31a, 31b, 32a and 32b are provided with toe portions 35a, 35b, 36a, 36b and 37a, 37b, which, as best illustrated in FIG. 4, define camming surfaces 38a and 38b confronting the second end legs 25a, 25b, and which camming surfaces are inclined inwardly and downwardly toward the second end leg.

To retain the panels 11, 12 within their respective depression 15a, 15b, there are provided suitable panel or glass stops 40, 41. The glass stops 40, 41 are formed of extruded somewhat resilient metal of open inverted cross section and, as illustrated, the glass stop 40 is of somewhat inverted U-shape while the glass stop 41 is of generally V-shape in cross section. Each of the glass stops 40 and 41, as best illustrated in FIGS. 2 and 4, are provided with a pair of legs 43a, 42b, 43b, and 42b, 43a, 42b. The first leg is provided at its free end with a toe portion 44, FIG. 4, defining a lip extending toward the other leg 43a, 43b. The face of the toe portion 44 confronting the other leg defines a camming surface 45 inclined upwardly in the open section toward the other leg and adapted to snap over the camming surface 38 in one of the framing members 10a, 10b. The first leg 42a, 42b is further provided at its other end with a sealing channel 46a, 46b adapted to retain a sealing gasket 47. The other leg 43a, 43b is provided with a first end adapted to seat on the respective jamb surface 13a and 13b and is operably connected to the other leg end to the embodiment of the glass stop, illustrated in FIG. 2, the legs 43a and 42a are interconnected by a transverse leg or bight portion 49, while in the embodiment of glass stop, illustrated in FIGS. 3 and 4, the ends of the legs 43a, 42a are directly connected together.

It will be appreciated that each of the glass stops 40 and 41 are dimensioned so that the spacing between the ends of the open legs is such that the glass stop may be used in a plurality of selective positions to engage one of the intermediate legs 31a, 31b, 32a, 32b or the first end leg 24a, 24b. More specifically, the glass stop 40, illustrated in FIG. 2, can be used with either of the intermediate legs 31a, 32a; while the glass stop 41, illustrated in FIGS. 3 and 4, is dimensioned for use with either the first end leg 24a or the intermediate leg 31b. It will be understood, of course, by enlarging the jamb surfaces 13a, that a single glass stop could be utilized with any or all of the intermediate legs and the first end legs. Additionally, it will be seen that the vertical or projected length of the first legs 42a, 42b of the glass stops 40 and 41 are slightly longer than the vertical length or vertical projection of the second legs 43a, 43b of the glass stops 40 and 41 so that with the free end of the second legs 43a, 43b resting on the jamb surfaces 13a, 13b, the toe portions 35a of the respective glass stops extend within the associated depressions 15a, 15b of the framing members 10a and 10b; and the toe portions 44 of the glass stops will interlock with the selected toe portions 35a, 35b, 36a, 36b, or 37a, 37b.

Advantageously, the present framing member structure according to the present invention permits a single framing member 10a, 10b to accommodate various thicknesses of panel elements 11, 12. This may be accomplished either by the use of a single glass stop or by the provision of various size glass stops. In other words, the glass stop 40 is selectively positionable with either of the intermediate legs, and the glass stop 41 is positionable with the intermediate leg 31a, 31b or the first end leg 24a, 24b. Additionally, various thicknesses of sealing gasket surface 27 and 47 may be associated with the framing members 10a, 10b and with the glass stops 40 and 41 to provide for small variations in the thicknesses of the panel members.

Advantageously, the glass stops 40 and 41 may be readily assembled with a framing member 10a, 10b without the use of exposed screws or fastening portions. Specifically, the selected glass stop 40 or 41 is placed with the end of the second leg 43a, 43b on the respective jamb surface 13a or 13b, and the camming surface 45 of the glass stop is snapped over the selected camming surface 38 of a framing member to interlock the toe portion 44 of the glass stop 40 or 41 with an associated toe portion 35a, 35b; 36a, 36b; 37a, 37b of a frame member. It will be observed that the over-center travel of the gasket 47 toward a respective panel 11, 12 during assembly of the glass stop 40 or 41 with a respective framing member is minimized so that the glass stop is readily assembled with a minimum of effort.

Although the present invention has been described by reference to various embodiments thereof, it will be apparent that numerous other modifications and embodiments will be devised by those skilled in the art which will fall within the true spirit and scope of the present invention.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. A frame structure comprising, in combination, a framing member comprising in cross section a shallow channel shaped depression intermediate its ends defined by first and second end leg portions and a bottom portion, a jamb surface extending from the top of said first leg portion outwardly away from said depression, said second leg portion extending upwardly from said depression above said jamb surface, and at least one intermediate leg portion extending upwardly from said depression above said jamb surface; and

2. Said intermediate said end leg portions, said first end leg portion and said intermediate leg portion having toe portions coplanar with the jamb surface forming lips extending...
toward said second leg portion, said toe portions defining a camming surface on their inner surfaces which face said second end leg portion inclined downwardly toward said said second end leg portion and sealing portions adjacent the end of said second leg portion for retaining sealing gasket means; and additionally including a panel stop member formed of extruded, somewhat resilient, metal of open inverted cross section having a first end leg and a second leg, said first leg being provided with a toe portion forming a lip extending toward said second leg, the surface of the last-mentioned toe portion which faces said second leg defining a camming surface inclined upwardly toward said second leg and adapted to snap over the camming surface of said leg portions, said first leg being provided adjacent its other end with sealing portions adapted to retain sealing gasket means, said last-mentioned toe portion extending into said depression and interlockingly engaging the toe portion of a selective one of said leg portions; said second leg having a first end spaced apart from said first end of said first leg and seated on said jamb surface, and having its second end operatively connected to the second end of said first leg.

2. A frame structure comprising, in combination, a framing member comprising in cross section a jamb surface, a depression defined in said jamb surface by first and second end leg portions and a bottom portion, said second leg portion extending upwardly from said jamb surface, and at least one intermediate leg portion extending upwardly from said bottom portion intermediate said end leg portions, said first end leg portion and said intermediate leg portion having toe portions coplanar with the jamb surface forming lips extending upwardly from said end leg portion, said toe portions defining a camming surface on their inner surfaces which face said second end leg portion inclined downwardly toward said second leg portion; and additionally including a metal panel stop member of open inverted cross section having a first end leg and a second leg, said first leg being provided at a first end with a toe portion forming a lip extending toward said second leg, the surface of the last-mentioned toe portion which faces said second leg defining a camming surface inclined upwardly toward said second leg and adapted to cammingly snap over the camming surface of said leg portions, said last-mentioned toe portion extending into said depression and interlockingly engaging the toe portion of a selective one of said leg portions; said second leg having a first end spaced apart from said first end of said first leg and seated on said jamb surface, and having its second end operatively connected to the second end of said first leg.

3. A building construction comprising an extruded metal framing member defined in cross section by a shallow channel shaped depression intermediate its ends defined by first and second end leg portions and a bottom portion, a jamb surface extending from the top of said first leg portion outwardly away from said depression, said second end leg portion extending upwardly from said jamb surface, and at least two intermediate leg portions extending upwardly from said bottom depression intermediate said end leg portions, said first end leg portion and said intermediate leg portions having toe portions coplanar with the jamb surface, forming lips to define toward said second end leg portion, said toe portions defining a camming surface on their inner surfaces which face said second leg portion inclined downwardly toward said second end leg portion and inwardly toward said bottom portion, and sealing portions adjacent the ends of said second leg portion; a panel stop member formed of extruded, somewhat resilient, metal of open inverted cross section having a first end leg and a second end leg, said first end leg being provided with a toe portion at a first end forming a lip extending toward said second leg, the surface of the last-mentioned toe portion which faces said second leg defining a camming surface inclined upwardly toward said second leg portion, said first leg being provided adjacent its other end with sealing portions adapted to retain sealing gasket means, said last-mentioned toe portion extending into said depression and interlockingly engaging the toe portion of a selective one of said leg portions, said second leg having a first end spaced apart from said first end of said first leg and seated on said jamb surface, and having its second end operatively connected to the second end of said first leg.

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