Aug. 25, 1970 N. NELSSON 3,525,189

STRUCTURAL MEMBER AND WALL ASSEMBLY INCLUDING SAME

Filed Oct. 11, 1968

Fig. 1.

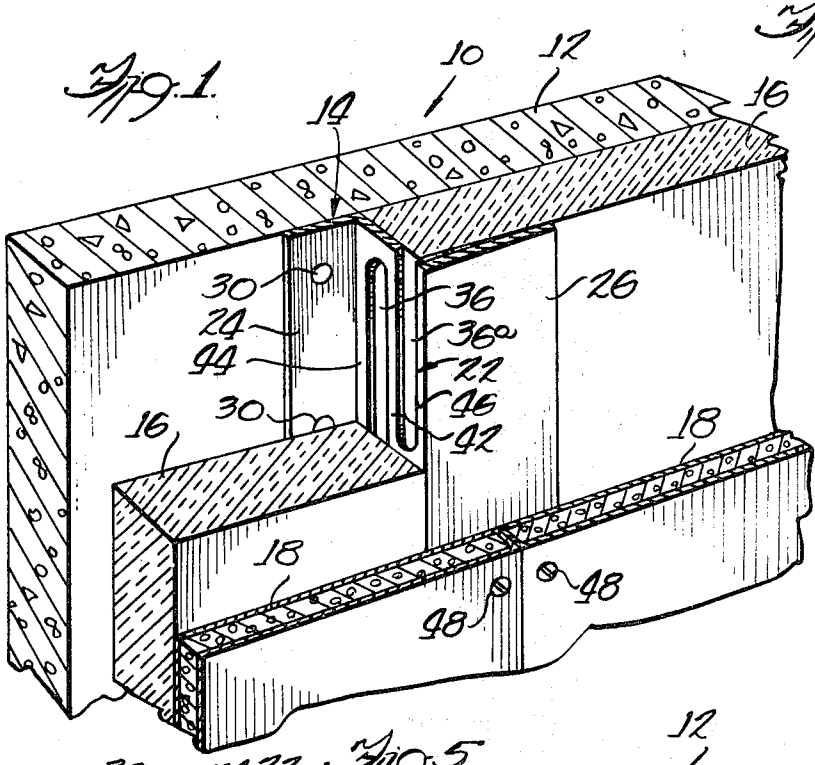


Fig. 2.

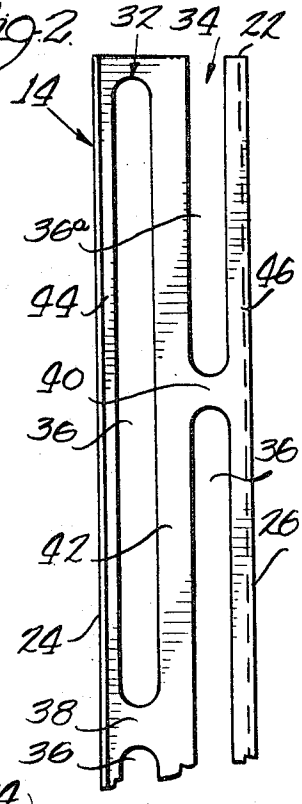


Fig. 5.

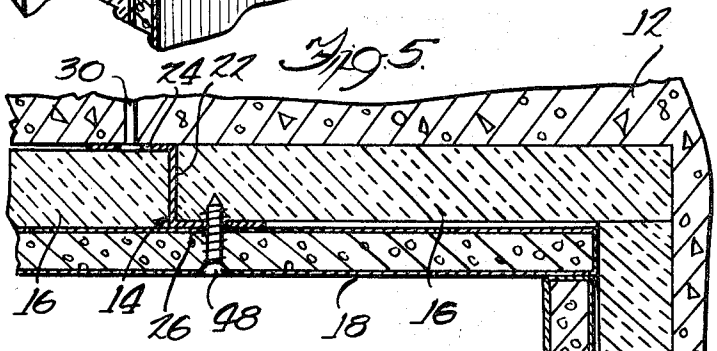


Fig. 4.

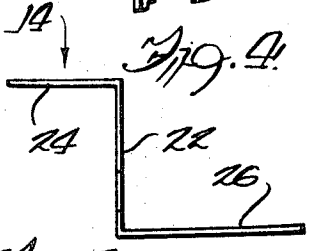


Fig. 6.

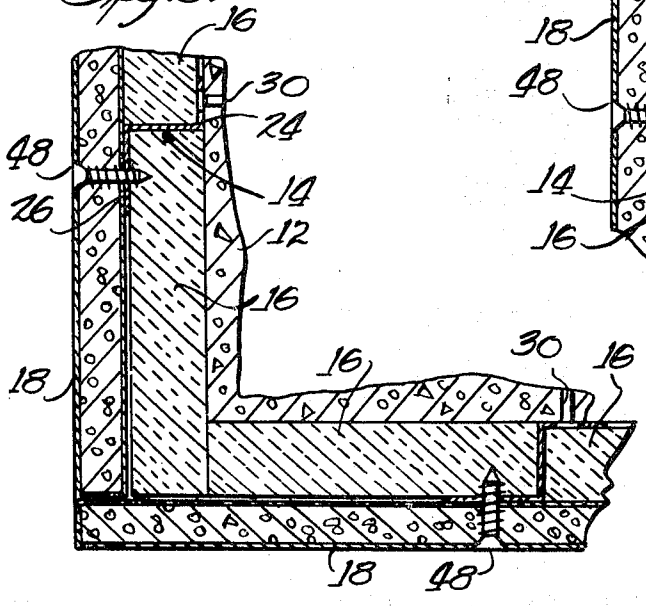
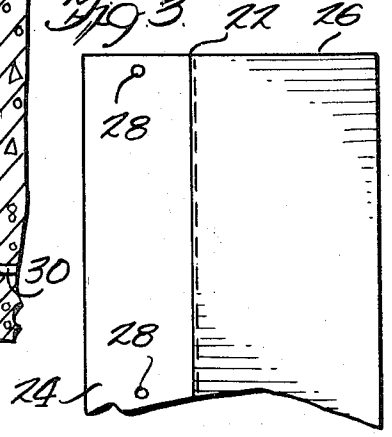


Fig. 3.



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3,525,189

STRUCTURAL MEMBER AND WALL ASSEMBLY INCLUDING SAME

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U.S. Cl. 52—378 4 Claims

ABSTRACT OF THE DISCLOSURE

An elongated unitary Z-shaped furring member has a web formed with two columns of closely spaced elongated openings to reduce heat transmission across the member. The openings of the two columns are arranged in a staggered overlapping pattern, with each opening centered on the space between a pair of adjacent openings in the opposite column. One flange of the furring member is secured to a masonary wall and the other flange overlies and retains insulating panels, with wallboard finishing panels being secured to the retainer flange.

This invention pertains to metal furring members for use in building construction and more particularly pertains to metal furring members for retaining insulating panels and supporting interior wall components on a wall such as a masonry exterior wall.

Previously proposed means of securing panels of insulation and a covering surface to a wall, such as a masonry exterior wall, have included the use of clips and beads of adhesive and various combinations of these fastening means. Such prior constructions using anchoring clips have included Z-shaped clips having a pair of flanges connected by a web, wherein one flange was secured to the wall and the other flange overlaid a room-side portion of a panel of insulation and supported screw-attached covering wall panels. One problem arising from this type of construction was the difficulty of locating the near flange of the clip when the wall panel was placed over the insulation. Another problem arising from such construction was the subsequent appearance of shadows or discoloration on the room side of the covering wall surface overlying each clip, as a result of heat transfer from the room-side surface to the exterior wall. In short, the clips provided local areas of greater heat transfer through the wall assembly than did the areas between the clips. In some cases the use of clips and/or beads of adhesive did not provide an adequate amount of securement.

It is an object of this invention to provide a solution to the aforenoted problems.

It is a further object of this invention to provide for convenient and economical securement of finishing wall components to a wall, with a low coefficient of heat-transfer between the finishing components and the wall in the area of securement.

It is a further object of this invention to provide for convenient and economical assembly of insulating panels and overlying finishing wall panels on a masonry wall, while providing adequate securement for the insulation and the finishing panels and eliminating problems of discoloration or "shadowing" due to differentials in heat transfer rates in various areas of the finished wall.

It is another object of this invention to provide an improved furring member.

Further and additional objects and advantages will appear from the description, accompanying drawings and appended claims.

In one embodiment of this invention a Z-shaped furring member has one flange secured to a masonry wall with its web extending generally normal to the wall, between adjacent panels of insulating material, and its other flange overlying the adjacent edge portion of one of the insulating panels. The web of the furring member is formed with a plurality of elongated openings therethrough oriented with their major dimension parallel to the longitudinal dimension of said web and disposed in staggered overlapping relation to one another throughout the length of said web to preclude conduction of heat directly across said web. Interior wall components are secured to the inner overlying flange.

For a more complete understanding of the invention, reference should now be had to the embodiment illustrated in the accompanying drawing and described below, by way of example of the invention.

FIG. 1 is a perspective view of a portion of a wall assembly embodying teachings of this invention;

FIG. 2 is a side view of the furring member of the assembly of FIG. 1;

FIG. 3 is a front view of the member of FIG. 2;

FIG. 4 is an end view of the member of FIG. 2, and

FIGS. 5 and 6 are cross sectional views in a horizontal plane of interior and exterior corners, respectively, of a wall assembly as in FIG. 1.

The wall assembly **10** illustrated in FIG. 1, includes an outer wall **12**, a metal furring member **14** secured to the wall, insulating panels **16**, and interior finishing panels **18** secured to the furring member. The wall **12** is of masonry construction such as concrete, stone, brick, masonry blocks or the like. Panels **16** are panels, boards or blocks of insulating material such as an expanded polystyrene or urethane resin possessing sufficient integrity to maintain their form during handling and subsequent to installation. The illustrated finishing panels are gypsum wallboard, i.e. a cast gypsum core within a paper sheath.

Referring also to FIGS. 2, 3 and 4, furring member **14** is a unitary element of a Z configuration in cross section and comprises a planar web **22** and planar lateral flanges **24** and **26** extending in opposite directions from the respective edges of the web. Flange **24** extends substantially at right angles to web **22** and is formed with openings **28** to receive suitable driven fasteners **30** (FIG. 1). The fasteners **30** penetrate the masonry and secure the member **14** to wall **12**. Flange **26** also extends substantially at right angles to web **22**, though it may define an included angle therewith of slightly less than 90°, as seen in FIG. 4, whereby it is inclined slightly toward the wall when the member **14** is installed, see FIG. 1.

Referring particularly to FIG. 2, the web **22** is formed with two rows **32** and **34** of oblong openings **36** oriented so that their major dimensions are aligned longitudinally of the web. Opening **36***a* represents a fractional opening, e.g. one-half of an opening **36**, as may occur at an end of an element **14**. The openings in each column are closely spaced, and define narrow web connecting segments **38** and **40** therebetween. As illustrated, the openings of the two columns are staggered so that the midpoint of an opening is transversely opposite each of the segments **38** and **40**. Thus there are no heat conduction paths extending directly across the web **22**. Rather, the heat conduction paths are extended to have a minimum length approximately equal to half the length of an opening **36** plus the width of the web. Further, the relatively close spacing of the columns **32** and **34**, as indicated by the narrow width of the intervening strip **42**, and the narrow width of segments **38** and **40** provides a conduction path of minimum cross sectional area. Thus, heat transmission across web **22** is greatly reduced. However, the strips **44** and **46** at each outer edge of the openings, together with the flanges, the center strip **42** and the connecting seg-

ments **38** and **40**, provide sufficient structural integrity of the member **14** to maintain the flanges in spaced relation to one another and to support the interior wall.

FIGS. 5 and 6 illustrate wall assemblies of this invention traversing an interior corner and an exterior corner, respectively. Components are numbered as in the embodiment described above. In each instance, the joints between adjacent panels **18** may be suitably treated or covered as desired. For instance, with gypsum wallboard panels **18**, the various joints may be covered with joint compound and tape, or corner beading, as appropriate, in a known manner.

As illustrated in FIGS. 1, 4 and 5, the web **22** of each member **14** extends between the edges of adjacent panels **16**. Flange **26** overlies the edge portion of the panel at one side of the respective joint and may serve to retain that panel during installation, prior to application of the interior panels **18**. Generally, a furring member **14** is installed with each course of insulation panels or blocks. Accordingly, the panel having a free edge at each joint, i.e., overlying flange **24**, normally is retained by a furring member **14** along its opposite edge. In any event, the panels **16** ultimately are covered and held in place by the interior panels **18**.

During assembly, an insulation panel **16** may be positioned on the wall **12**, a member **14** then placed with its flange **26** over-lying an edge portion of this panel, and the fasteners **30** subsequently driven through the flange **24** and into the wall **12** to mount the member **14** and to retain the insulation panel underlying flange **26**. In any event, the fasteners **30** are driven to secure each member **14** in place prior to the placement of the panel **16** which overlies the respective flange **24**. The inclination of flange **26** provides slight resilience for gripping the panel or panels thereunder as an aid in temporarily supporting the panels during installation.

After the members **14** and panels **16** are in place, the covering panels **18** are positioned and are secured to the flanges **26** by driving fasteners **48** through these panels and through the underlying flanges **26**. The panels **18** may be positioned with their longitudinal side edges extending either horizontally, transverse to the members **14**, or vertically, parallel to members **14**, as desired. The fasteners **48** may extend into the panels **16**, as illustrated in FIGS. 5 and 6, and may, for instance, be self-tapping rotary screw fasteners as disclosed in U.S. Pat. No. 3,056,234.

The insulation panels **16** normally will be of an appropriate size so that an attachment flange **26** of a member **14** is disposed beneath each vertical joint between the overlying interior panels **18**. Further, depending upon the size of the insulation panels and of the interior panels, a member or members **14** may lie between such joints, with the overlying interior panels **18** being secured to the flanges **26** thereof for additional support of the interior panels **18**.

The described furring member has proven beneficial in providing resistance to heat transfer across a wall and in avoiding the development of noticeable shadow spots, while providing effective means for securing the covering wall components to the supporting structural wall.

By way of one specific example, a furring element as illustrated and described herein was fabricated of 24 gauge (about 0.028") hot-dipped galvanized sheet steel, the web **22** being 1" wide and formed with two columns of openings **36** spaced ¼" transveresly of the web. Each opening **36** was ¼" wide and 4¼" long, and the openings in each column were spaced ¼". Thus the strip **42** and the segments **38** and **40** each were ¼" wide, and the strips **44** and **46** were ⅛" wide. A test was conducted on this panel with one flange submerged in an ice bath at 32° F., and the web and the other flange exposed to an ambient air temperature of 77° F. At an equilibrium state, the submerged flange was at a temperature of 36° F., and the flange exposed to ambient air was at a temperature of 64° F., representing a 28° F. differential between the flanges. Under the same test conditions, a similar member having a continuous web provided a temperature differential of only 14.5° F., between the flanges.

Other embodiments will be apparent from the foregoing disclosure. For example, where the interior covering is plaster, the lath component may be secured to the attachment flange.

It will be appreciated that a very unique and economical structure has been provided which meets the aforestated objects.

While particular embodiments of this invention are shown and described above, it will be understood that the invention is not to be limited thereto since many modifications may be made by those skilled in the art, particularly in light of the foregoing disclosure. Accordingly it is contemplated by the appended claims to cover any such modifications as fall within the true spirit and scope of this invention.

I claim:

1. A wall assembly comprising a masonry wall; self-supporting panels of insulating material overlying one surface of said masonry wall; a plurality of elongated metal furring members of generally Z configuration in cross section; each of said members including a web extending generally normal to said masonry wall between adjacent insulating panels, a first flange beneath the adjacent edge portion of one of said adjacent panels, and a second flange overlying the adjacent edge portion of the other of said adjacent panels, said web being formed with a plurality of elongated openings therethrough oriented with their major dimension parallel to the longitudinal dimension of said web and arranged in parallel columns extending the length of said web, adjacent openings in each of said columns being close to one another to define narrow web connecting elements therebetween, and said openings of adjacent columns being disposed in staggered overlapping relation to one another throughout the length of said web to preclude conduction of heat directly across said web; fasteners extending through said first flange of each of said furring members and penetrating said mansonry wall for securing said members to said wall; surface wall components overlying and covering said insulating panels and said second flanges; and further fasteners extending through said surface wall components and said second flanges for securing said components to said second flanges.

2. A wall assembly as in claim **1** wherein said surface wall components comprise gypsum wallboard panels.

3. A wall assembly as in claim **1** wherein said openings in said web of each of said furring members are arranged in two parallel columns, and each of said openings is longitudinally centered on a connecting element in the other of such columns.

4. A wall assembly as in claim **1** wherein each of said openings is of a length greater than four times the width of said web.

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U.S. Cl. X.R.

52—410, 508, 732