Feb. 4, 1969 R. BARAINSKY 3,425,181

PANELING ARRANGEMENT

Filed May 6, 1966 Sheet 1 of 2

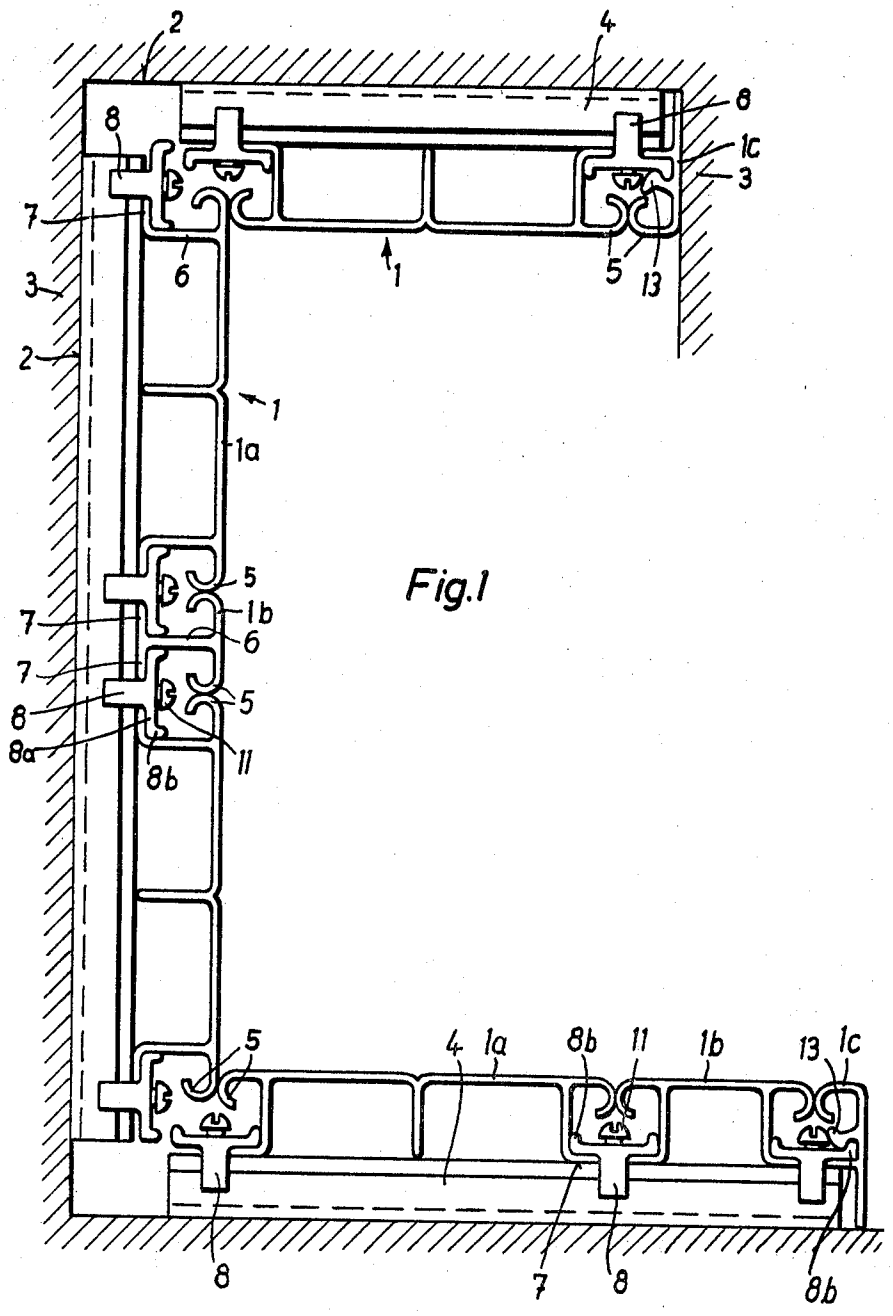


Fig.1

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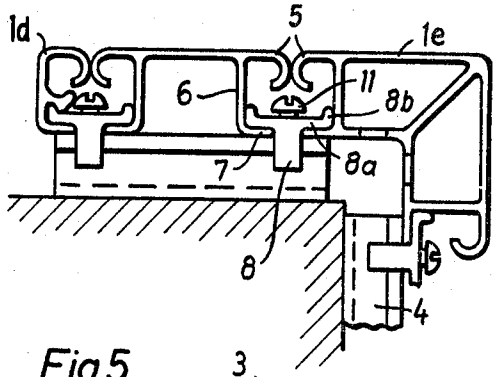


Fig.2

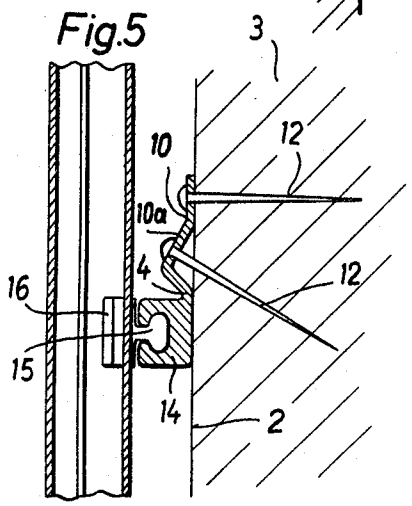


Fig.5

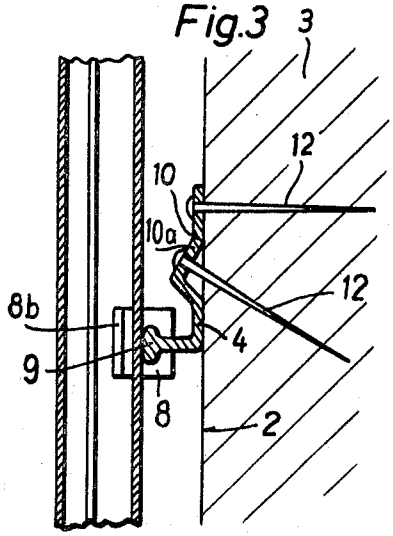


Fig.3

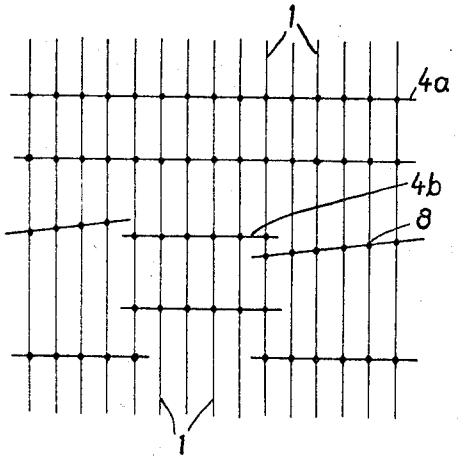


Fig.4

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PANELING ARRANGEMENT

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U.S. Cl. 52—480 9 Claims
Int. Cl. E04b 2/72; E04c 2/38; E04f 13/00

ABSTRACT OF THE DISCLOSURE

An arrangement for paneling wall surfaces in which paneling strips are mounted on lathing provided on wall surfaces. The arrangement includes rail members which serve as the lathing, the panel strips themselves made of plastic and arranged on and fastened to the rail members and clamping members having flange-like projections for accomplishing the fastening. The panel strips have resilient bent portions which act as feet on the sides of the strips which face the rail members. The bent portions of the panel strips are arranged to slide between the flange-like projections and the rail members thereby securing the panel strips to the rail members without preventing the panel strips from expanding or contracting with changes of temperature. The panel strips are also provided with freely protruding resilient members on at least one front side portion thereof which contact an adjacent panel and cover the clamping members.

The present invention relates to a paneling arrangement for wall surfaces.

The application of panels to walls of stationary and movable structures such as buildings, railroad vehicles, ships and the like in order to provide such surfaces with a desired appearance is well known and panels have been used in various forms. Generally, when using wood or plastic panels, these panels are in the form of large plates or strips, these strips being adapted for horizontal as well as vertical mounting. The conventional manner of mounting wood panels has proven successful and is also, generally, used for plastic panels. However, for plastic panels, this often leads to drawbacks since the materials differ substantially from each other in their properties and more particularly in the different heat expansion characteristics of wood and plastic. When using plastic panels in the form of large plates, the mounting of such plates is such that they overlap each other in a shingle-like manner and therefore the plates can freely expand so that the heat expansion characteristic for such plates does not have to be considered.

On the other hand, when using panel strips having long lengths, the heat expansion of a plastic panel must be taken into consideration. In mounting panel strips, it is customary to mount the same by means of slots in such panels. Thus, there is a danger with such an arrangement that a screw may be tightened to such a degree as to unduly stress the panel and cause a stress corrosion in the strip profile. This may lead to deformation and bending throughout the strip which cannot be eliminated. The heat expansion in the transverse dimension of the strip panel has not been taken into consideration when designing such plastic panels. The reason for this is that up till now, a box-type cross section of the profile strip has been exclusively used and such a construction can only compensate for temperature changes by building up inner stresses within the strip since it is a rigid construction.

Another problem occurring in the strip panels is that they must be mounted in substantially the same manner, i.e., exactly aligned laths must first be mounted on the

structural component that is to be paneled, these laths running in a direction which is transverse to the direction in which the panel strips are later mounted. In addition to the requirement of an exact alignment of these lath strips, skilled labor is necessary for the mounting of the laths. The mounting is generally achieved by placing a plug into a bore in the wall and then mounting a lath strip by means of a screw through this plug. For screw fastening plastic profiled panels, the panel is usually provided with bores at the desired mounting position. If the plastic panel is provided with pre-bored holes, this requires an increase in the exactness with which the lath strips are aligned and mounted on the wall surfaces.

The prior art has attempted to overcome the heat expansion problem of such panels by designing the strip panels and the mounting thereof in such a manner that hollow spaces are formed behind the panel surface through which air can circulate. However, for a horizontal positioning of the lath strips which serve for mounting the panels, only a circulation through the hollow spaces of the plastic profile is possible. In such an arrangement, the lower side of the closed box-shaped plastic profile which faces the mounting surface, seals the hollow space between the mounting surface and the lower side of the panel and also at the supporting laths in such a manner tthat, in effect, no circulation can take place between the wall and the profiled panel strip.

It is, therefore, an object of the present invention to provide a panel arrangement which overcomes the aforementioned disadvantages of the prior art arrangements.

It is another object of the present invention to provide a panel arrangement for plastic strip panels which takes into consideration the heat expansion of such panels.

It is a further object of the present invention to provide a panel arrangement for plastic strip panels which does not require precise mounting and which is simple to mount.

In accordance with the present invention, there are provided clamping members having flange-like tabs which members are slidably arranged on rails that serve as the lathwork for the panels. The clamping members are adapted to be secured in a position in which the flange-like tabs slidably engage bent side portions of the panel strip. Thus, the mounting for installing such panels is considerably simplified. The panel strips which are designed with hollow profiles, are open at the rear side thereof or are provided with perforations for permitting air circulation behind the panel. The heat expansion is also compensated for by providing at least one front side of the panel strip a freely projecting resilient portion which permits movement of the panel in the direction transverse to its length and therefore the heat expansion of the panel in the longitudinal as well as in the transverse direction is taken into consideration.

Additional objects and advantages of the present invention will become apparent upon consideration of the following description when taken in conjunction with the accompaying drawings in which:

FIGURE 1 is a top view of a paneling arrangement according to the present invention.

FIGURE 2 is a top view of a paneling arrangement for wall surfaces having a protruding corner.

FIGURE 3 is a cross-sectional view through a mounting rail according to the present invention.

FIGURE 4 is a schematic representation of a possible arrangement according to the present invention having an unexact positioning of the support rails and an exact installation of the paneling strips.

FIGURE 5 is a cross-sectional view through a further embodiment of a mounting rail according to the present invention.

Referring now to the drawings, there are shown in FIGURE 1 paneling strips **1** having any desired length and width and provided with hollow profiles. These panel strips are mounted to the wall surfaces **2** of a stationary or movable structural component **3** by rails **4** which are secured to the wall surfaces in any suitable manner. As shown, the paneling strip **1** may be in the form of a conventional strip **1***a* having a predetermined width and length, an intermediate strip **1***b* having a smaller width, or an end strip **1***c* for providing a finished surface at the end of the panel. The panel strip may also take the form of, as shown in FIGURE 2, a strip **1***d* of a different design, or a corner strip **1***e* for paneling protruding corners. The panel is provided with a hollow profile which is open to the rear side or it may be provided with perforations for permitting suitable air circulation so as to cool the panels.

In accordance with a feature of the present invention, each paneling strip is provided at at least one front side with a freely protruding resilient portion **5**. These portions, in cross section, are curved and are secured to the front surface of the panel at only one end so as to provide a resilient effect at the end of the panel. Due to the profile of the open rear side of the panel strip which faces the wall and which spaces the front panel surface from the wall, a spring action within wide limits is possible at the panel sides. As shown, the outer cross pieces **6** which are positioned at the sides of the panels are bent in an L-shape with the upright portion of the L being transverse to the rail **4** and the leg portion **7** resting against the rail. The leg portion **7** is preferably resilient and serves for securing the panel to the rail in that the clamping member **8** is placed over the leg and thus engages the leg.

As shown in FIGURE 3, the rails **4** are suitably mounted on the wall surface **2** and are provided with a T-shaped head portion **9** and a securing leg **10**. The clamping members **8** are provided with a T-shaped cut-out which corresponds to the shape of the head **9** so that the clamping members may be slid on to the rail from one end thereof and therefore may be slidably positioned along the rail. The clamping members are secured at the desired places along the rail **4** by screws **11** as shown in FIGURE 1. The rail **4** is secured to the structural component **3** by means of steel nails **12** which pass through the leg **10** and into the component **3**. In order to insure a more secure mounting of the rail, the leg **10** may be provided with a slanted portion **10***a* so that the nails **12** enter the wall at different angles. The rail can also be mounted on the wall by gluing. Although the rail has been shown as having a T-shaped cross section, a clamping member may also be formed for coacting with the T-shaped portion of a U-shaped rail.

Referring again to FIGURE 1, the clamping member **8** is shown as having a flange-like tab **8***a* projecting from the body of the member and which extends in the direction of the rail, the flanges being adapted for gripping the legs **7** formed on the panel strips. The portions **8***a* advantageously are provided with bulge-like projections **8***b* at the ends thereof for providing better support for the paneling strips at the L-shaped side profile portions. Furthermore, the bulges **8***b* coact with the portion **13** which is provided, for example, on the end profile strip **1***c* as shown in FIGURE 1. The portion **13** overlaps the bulge **8***b* so that a locking engagement of the portion **13** and bulge **8***b* is provided for obtaining a secure attachment of the end strips to the rails.

The mounting of the panel strips is carried out by first fastening the rails **4** to the walls and then sliding the clamping members **8** over the T-shaped portions of the rails so that the flanges **8***a* of the clamping strip overlap the leg portions **7** of the panel, with the flange **8***b*, generally, contacting the upright portion of the leg. Then, the screws **11** are tightened so that the clamping members are secured to the rail **4**, the clamping members being

arranged so that the screws do not contact the legs **7**. Thus the leg **7** is only supported on the rail **4** and is not fastened thereto. In this manner, a slight displacement of the panel strip caused by heat expansion of the panel is not hindered and therefore the panel is not undesirably stressed. This is particularly true for heat expansion in the longitudinal direction. For heat expansion of the strips in the transverse direction, due to the resilient portions **5** of the strip, a slight expansion in the traverse direction is also not hindered. The mounting arrangement is such that the end strip panels are first connected to the rail **4** by the clamping members **8**. Then, the succeeding panel strip is slid laterally under the clamping member **8** so that the leg portion **7** at the rear side of the panel is overlapped by the flange **8***a*. Clamping members are then slid onto the rail so that they overlap the leg portion **7** provided at the other side of the panel strip whereupon the screws **11** of these clamping members are firmly tightened. Thus, during the mounting, the arrangement is such that the positioning of the clamping members takes place in turn with the installation of the panel strips.

In accordance with a feature of the present invention, it is not necessary that the rails for mounting the panels be exactly aligned on the wall or other structural member. It is merely sufficient if these rails are positioned by sight in an approximately straight arrangement and FIGURE 4 shows different possibilities for the positioning of the rails on the wall in a nonaligned manner, which positioning does not result in the installation of the paneling strips in an exact manner becoming more difficult. As shown, an uninterrupted rail **4***a* which extends across the entire wall section may be used and rails such as **4***b* which extend only over a portion of the wall may also be used. The rails can be mounted horizontally or in an approximately horizontal position and can also be sloped to a certain degree as can be seen from FIGURE 4. The paneling strips **1** are retained at the points of intersection by the clamping members **8** denoted by dots and although the distance between the rails should be as uniform as possible, an exact measure of this distance is, however, not necessary. It is also not of great importance if individual rails are warped to a small extent. Thus, in spite of these normally adverse conditions, the panel strips **1** can be installed with little effort in a faultless and aligned manner.

It can thus be seen, in accordance with the present invention, a simplified mounting arrangement is provided in which the heat expansion characteristic of the panel strip in the longitudinal as well as the transverse direction is taken into consideration. Due to the clamping member according to the present invention, the mounting pressure provided thereby is exerted only indirectly on the plastic panel so that a mounting which permits the sliding of the parts with respect to one another is guaranteed. Also, the supporting laths, i.e., the rails, for mounting the panels do not have to be exactly aligned, with a slight alignment being sufficient. Accordingly, the difficulties which have been encountered up till now due to the requirement of an exact aligning of the lathwork is eliminated, since the distances between the laths can vary without adversely affecting the mounting of the panels. Furthermore the plastic panels can freely expand so that an occurrence of inner stresses within the strip with a resulting deformation is prevented. Also, the mounting operation is very simple and does not require special knowledge or experience so that the mounting can be performed by laymen as well as experts with good results.

It will be understood that the above description of the present invention is susceptible to various modifications, changes and adaptations, and the same are intended to be comprehended within the meaning and range of equivalents of the appended claims.

Referring to FIGURE 5, the clamping member **15** is shown as having a T-shaped portion which coacts with

the recess of a U-shaped head portion **14** of the rail **4**. The clamping member **15** is provided with bulge-like projections **16** at the ends thereof.

What is claimed is:

1. An arrangement for paneling wall surfaces in which paneling strips are mounted on a lathing provided on the wall surfaces, comprising, in combination:

rail members which serve as lathing for mounting on wall surfaces;

clamping members mounted on said rail members, individual ones of said clamping members having flange-like projections;

plastic panel strips arranged on said rails having resilient rearwardly extending bent portions on the sides thereof which face said rail members, said rearwardly extending bent portions then extending in a direction parallel to said rail members and being arranged in slidable contact with and between said projections and said rail members for positioning and securing said panel strips to said rail members;

said panel strips being further provided at at least one front side portion thereof with freely protruding resilient members which are curved in cross-section and terminate at a free edge spaced from said rail and clamping members, the resilient member of said at least one front side portion being in contact with an adjacent panel and covering said clamping member.

2. An arrangement as defined in claim **1** wherein said panel strips are formed as hollow profiled members having openings at the rear side thereof for permitting air circulation.

3. An arrangement as defined in claim **1** wherein said flange projection of said clamping members have bulge-like ends and said panel strip is provided with a portion which overlaps said bulge-like ends for providing a self-locking connection therewith.

4. An arrangement as defined in claim **1** wherein the bent portion of said panel strip which engages said flange projection of said clamping member is resilient.

5. An arrangement as defined in claim **3** wherein said rail member is provided with a T-shaped cross section and said clamping member is provided with a cut-out corresponding thereto for receiving said T-shaped cross section.

6. An arrangement as defined in claim **3** wherein said clamping member is provided with a T-shaped cross section and said rail member is provided with a portion adapted to receive said T-shaped cross section of said clamping member.

7. An arrangement as defined in claim **1** wherein said rail member is provided with a mounting leg having a slanted portion and means for mounting said rail member to the wall surface is provided at the mounting leg and at the slanted surface thereof.

8. An arrangement as defined in claim **1**, wherein said resilient members are curved inward in cross-section.

9. An arrangement as defined in claim **1**, wherein said individual ones of said clamping members have a screw inserted therein in such a way that when said screw is turned in, it abuts the one of said rail members on which said one clamping member is attached, thereby securing said one clamping member at any desired position along said one rail member.

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U.S. Cl. X.R.

52—489, 573, 630, 503