May 3, 1966 J. N. STARK 3,248,838

BUILDING PANEL CONSTRUCTION

Filed June 27, 1961 2 Sheets-Sheet 1

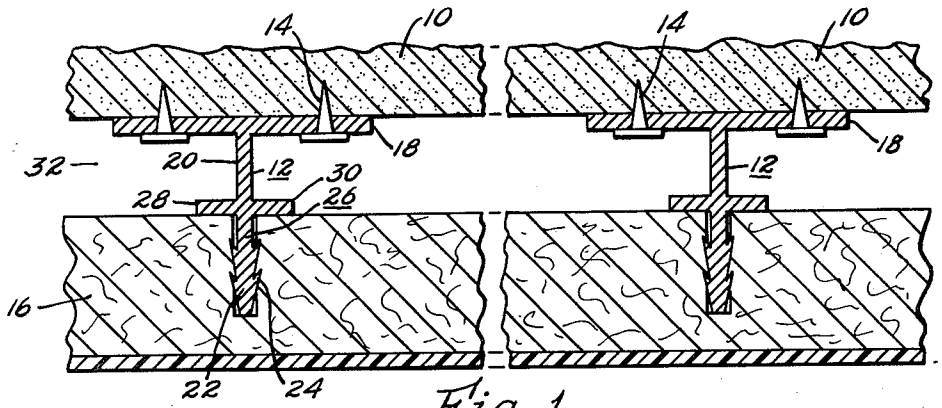


Fig. 1.

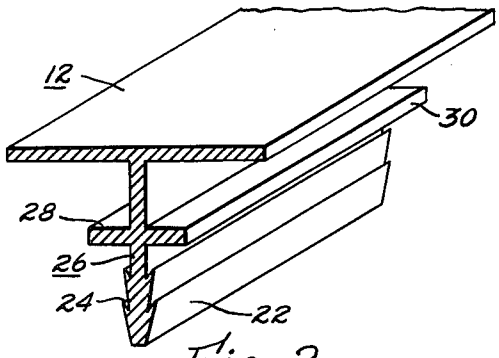


Fig. 2.

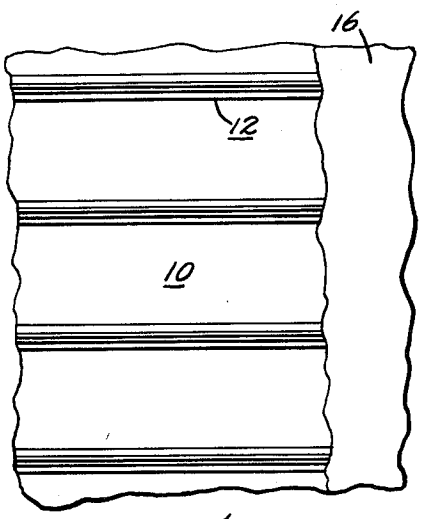


Fig. 3.

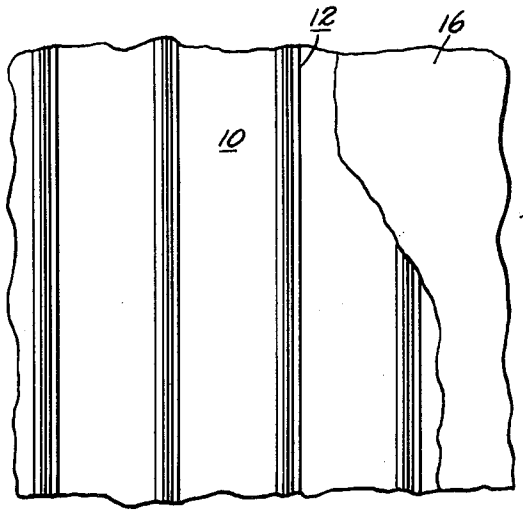


Fig. 4.

INVENTOR
Jack Norman Stark.
BY
E. H. Liss
ATTORNEY

May 3, 1966 J. N. STARK 3,248,838

BUILDING PANEL CONSTRUCTION

Filed June 27, 1961 2 Sheets-Sheet 2

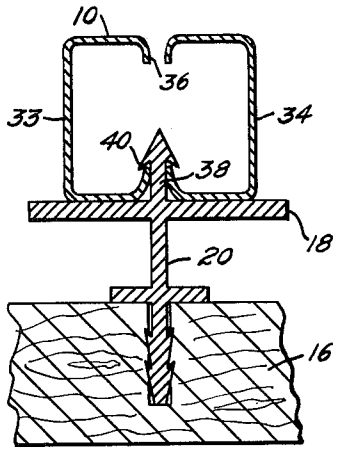


Fig. 5.

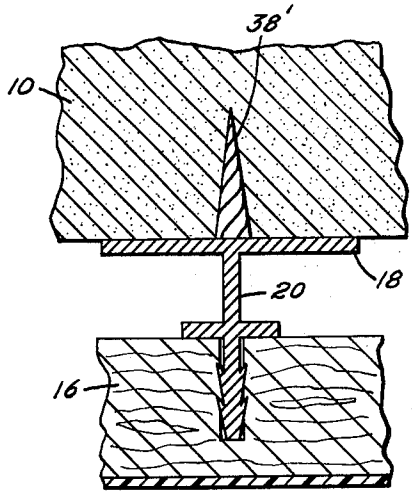


Fig. 6.

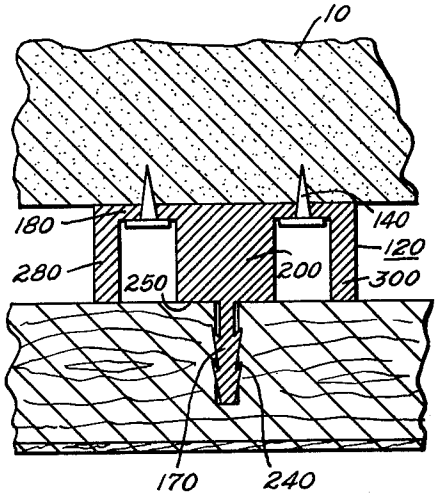


Fig. 7.

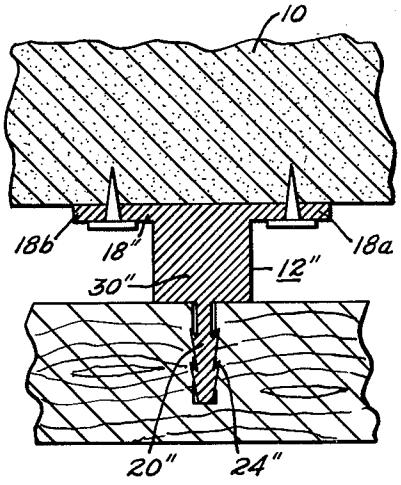


Fig. 8.

INVENTOR.
Jack Norman Stark.
BY
E. H. Liss
ATTORNEY

United States Patent Office 3,248,838 Patented May 3, 1966

3,248,838

BUILDING PANEL CONSTRUCTION

Jack Norman Stark, Shaker Heights, Ohio
(4825 Green Road, Warrensville, Ohio)

Filed June 27, 1961, Ser. No. 119,958
7 Claims. (Cl. 52—481)

This invention relates to a building structure, and, more particularly, to an improved blind fastening device for securing sheet material to a building structure.

In certain building structures pre-finished panels of sheet material are utilized to provide the main body of finished interior walls or ceiling surfaces. These panels may comprise plywood backing with layer of decorative laminated plastic on the exposed surface; they may be plywood with a finished surface on the exposed side; or they may be solid wood panels. These panels are produced in various sizes and each panel usually constitutes a relatively large area of wall or ceiling. This type of building construction has come into extensive use in commercial, industrial, and residential buildings.

Present practice utilizes various means to secure the sheet material to the building structure. One manner of securing this type of sheet material to a wall is to fasten the panels directly to the wall by brads or nails at the edges of the sheets and at intermediate portions where necessary. Frequently it is necessary to provide wooden furring strips and to nail them in place throughout the wall or ceiling area before the sheet material can be secured in position. In using either of these methods the construction is relatively slow and expensive. Furthermore, for finished interior wall surfaces it is desirable to provide blind fastening means. This involves setting each nail or brad below the surface and then filling the openings, sanding and staining. When plastic laminated sheet material with plywood or pressed wood fiber backing is employed the nailing method would not be practicable unless tongue and groove joints were provided at the edges of the boards.

Another method commonly employed where plastic panel board is utilized is to secure furring strips to the wall or ceiling structure; then bare plywood or other suitable backing of substantial thickness is nailed to the furring strips. The plastic sheet is then glued to the base. The adhesive used is volatile and toxic creating a fire and health hazard. Again, this is a costly, relatively slow and laborious method of applying wall or ceiling panel. A water base adhesive can be used but the known water base adhesives exhibit relatively poor adherence and introduce a warping problem. This method also is disadvantageous in that the nails on the base are likely to show through the plastic material or provide a bumpy surface. Further the nail heads may back through the plastic sheet material.

Still another method shown in the prior art is the wall board securing means disclosed in the patent to P. J. Keating, Serial No. 2,066,205, issued December 29, 1936. This patent discloses a fastening device comprising a metal strip having a projecting fin secured to the building structure. Bifurcated lugs which engage and interlock with the projecting fin are received in a T-slot in the back or unexposed surface of the wall board. This introduces a problem of machining a T-slot. Furthermore, in case of panel warping the lugs are likely to become disengaged.

The principal object of the present invention is to provide an improved building construction in which panels of sheet material can be secured to a building structure in a simple, safe and effective manner which permits longitudinal adjustment of the panel and provides a blind fastening means.

Another object of the inventor is to provide an improved blind fastening device for securing panels of sheet material to a building structure which provides air space between building structure and panel and aids in preventing warping of the panels and which enables simplified and rapid panel installation.

A further object of the invention is to provide an improved building construction in which panels of sheet material may be applied either directly to wall or ceilings or to wall or ceiling frame construction and which presents a permanently smooth uninterrupted panel surface on the exposed side.

Other objects and advantages of the invention will be apparent from the following detailed description taken in connection with the accompanying drawings in which:

FIG. 1 is a partial transverse sectional view of a preferred embodiment of the invention, illustrating the fastening device secured directly to a wall;

FIG. 2 is a detailed perspective view of the fastening device utilized in the embodiment of the invention illustrated in FIG. 1;

FIG. 3 is a diagrammatic plan view of a portion of a wall or ceiling with sheets of material secured thereto in accordance with the invention;

FIG. 4 is a view similar to FIG. 3 showing a different arrangement;

FIG. 5 is a view similar to FIG. 1 showing another embodiment of the invention with the fastening device applied to a fabricated stud;

FIG. 6 is a view similar to FIG. 1 illustrating a modified fastening device adapted to be fastened to a masonry wall.

FIG. 7 is a view similar to FIG. 1 illustrating an embodiment of the invention applied to a stud or rafter;

FIG. 8 is a sectional view of a further modification of the fastening device of the invention.

Briefly, the invention provides a means for fastening sheet material, as for example, wall board, panel board and other sheet material having a substantial thickness to a building structure which may be a concrete or masonry wall, ceiling joists or rafters or to studding or any building partitioning structure. Grooves are formed on the back or unexposed surface of the sheet material. A continuous strip of material having a flat base portion, forms the fastening device. The free end of the web portion which is remote from the base may be tapered in cross section for facilitating insertion in a groove of the sheet material. The sides of the web adjacent the free end may be provided with serrations or other impaling projections to insure a secure fastening to the panel. The base portion may be secured to the building structure by nailing through the base or by any other suitable means, as for example, an adhesive or suitable integral projections extending outwardly from the base. A supporting stop having substantial width parallel to the plane of the panel is provided for engaging the rear surface of the panel to provide air space behind the panel and to prevent warpage and disengagement of the panel as will be explained in detail.

Referring now to the drawings, FIGURES 1 and 2 illustrate one embodiment of the invention. A building structure **10**, which may be a wall or ceiling structure has secured thereto a fastening device **12**. The fastening device may besecuredto the building structure **10** by any suitable means, as, for example, nails, as shown. It will be understood, of course, that other suitable means may be used such as an adhesive. A panel of sheet material **16** is secured to the building structure by means of fastening device **12**.

The fastening device **12** shown in detail in FIG. 2 is in the form of a strip and may be extruded aluminum. Al-

though extruded aluminum strip is shown in the preferred embodiment, it will, of course, be understood that any suitable material may be used and the fastening device may be fabricated as well as extruded. The strip of fastening device **12** may be of any suitable length but preferably extends from end to end of the building structure wall or ceiling **10** as shown in FIG. 3 or from floor to ceiling of a wall as illustrated in FIG. 4. The fastening device includes a base portion **18** and a web portion **20**.

The web portion **20** in the illustrated embodiment includes a serrated end portion **22** having serrations **24** which constitute impaling means. The free end **26** may be tapered to a relatively sharp edge for facilitating insertion into the grooves or kerfs **17** of the panel **16**. Intermediate the free end **26** and the base **18** of the fastening device **12** flanges or stops **28** and **30** may be provided which extend outwardly from the web **20** in a plane parallel to the base **18**. The flanges **28** and **30** serve as stops for the panels **16** to assure existence of an adequate air space **32** between the building structure **10** and the rear surface of the panel **16**. This serves to provide insulation and air circulation thereby preventing heat loss and warping. Another advantage obtained from the stops or flanges **28** and **30** is the resistance to warping and disengagement of the panels from the impaling means. If the panel tends to bow outwardly from the building structure **10** the groove tightens and locks on the impaling means **22**. If, however, the panel tends to bow inwardly the groove tends to open releasing the panels. However, it can be seen that the flanges **28** and **30** engage the rear surface of panels **16** and prevent inwardly bowing. It should be apparent therefore that the unique structure of the present invention is effective in resisting warping and in deterring disengagement of the panels.

The modifications shown in FIGS. 5 and 6 are similar to the modification shown in FIGS. 1 and 2 differing therefrom only in the means for attaching the fastening device **12** to the building structure **10**.

The modification illustrated in FIG. 5 is particularly useful for use with fabricated metal studs. These studs comprise a pair of longitudinal frame members having reversely bent longitudinal portions **32** and **34**, respectively disposed in juxtaposition leaving a partially open seam portion **36** for receiving nails or other impaling means. Extending outwardly from the base **18** in a direction opposed to the web **20** is a securing means or projection **38** which includes spurs **40** for engaging the reversely bent portions **32** and **34** of the stud **10**.

The modification shown in FIG. 6 differs from that of FIG. 5 only in the design of the securing means or projections **38'**. A plurality of integral projections **38'** are provided which may be a pointed projection and may include spiral lands and grooves for securement in a masonry building structure.

The modification of the fastener **120**, FIG. 7, comprises a base portion **180** and a web portion **200** extending therefrom. Like the FIG. 1 modification this fastener is preferably a continuous strip of extruded or fabricated metal. However, the invention in its broader aspects may include a plurality of shorter fasteners. The base portion **180** has a pair of flanges **280** and **300** at each side edge extending perpendicularly to the base in the direction of the web portion **200**. Extending outwardly from the web portion in a direction parallel to the flanges **280** and **300** is a panel impaling strip **170** having serrations **240** adjacent its free end. The free end of the impaling strip is tapered similarly to the free end **26** of the FIG. 1 modification for facilitating assembly to the wall panel. The impaling strip is of reduced thickness relative to the web portion **200** thereby forming a shoulder **250** between the web portion **200** and the impaling strip **170** which is parallel to the base. The free ends of flanges **280** and **300** and the shoulders **250** are coplanar. Thus the shoulders **250** and the free ends of the flanges **280** and **300** form stop means which engage the unexposed rear surface of the panels **16** to provide air space between the panels **16** and the building structure **10** (shown as a stud in FIG. 7). This stop means also prevents warping and disengagement of the panels in a manner similar to the flanges **28** and **30** of the FIG. 1 modification. The fastener **120** is preferably secured to the building structure or stud **10** by means of nails or screws through the base as shown at **140** in FIGURE 7. However, in the broadest aspects of the invention it may be secured by other means such, as, for example, by a suitable adhesive.

Still another modification is illustrated in FIGURE 8. The fastener **12** shown in FIGURE 8 may be a strip of extruded or fabricated metal. It includes a base portion **18''** and a spacer strip **30''** which forms a stop portion or web portion. The spacer strip **30''** is of reduced width relative to base portion **18''**. Securing strips **18*a*** and **18*b*** are formed at each side edge of the base portion **18''** by the difference in width between the spacer strip **30''** and the base portion **18''**. An impaling strip **20''** projects from the side of the spacer strip **30''** and includes serrations **24''** adjacent its free end. The free end of the impaling strip **20''** is tapered for facilitating assembly with a panel **16**. Shoulders **15''** parallel to the base are formed between the impaling strip **20''** and the spacer strip **30''**. These shoulders engage the rear surface of the panel **16** to space them from the building structure and serve as stops to prevent warping and disengagement of the panels similarly to the flanges **28** and **30** of the FIG. 1 modification. Nails **14''** as shown may be employed to fasten the fastening strip **12''** to the building structure or a suitable adhesive may be employed.

In the building construction herein described the base of the fastening device is secured to the building structure which may be a masonry wall or studding. The fastening strip may extend for the entire length of the building portion or wall or may comprise a plurality of short strips in alignment for the entire length of the wall. The building panel is provided with continuous slots in its unexposed surface. The slots in the panels are pressed into engagement with the impaling strips until the rear surface of the panels engage the stops, flanges or shoulders.

It should now be apparent that a building construction has been provided which is economical, simple to use and which deters disengagement of the panels and tends to prevent warping of the panels. The hazards involved in the use of adhesives with toxic, volatile solvents is eliminated and a smooth outer surface is assured.

Although certain specific embodiments and modifications have been shown and described for the purpose of illustration, the invention is not limited to the particular details of construction shown, but in its broadest aspects includes all equivalent embodiments and modifications which come within the scope of the invention.

I claim as my invention:

1. A building construction comprising building wall structure, a decorative wall panel and fastening means for securing said decorative wall panel to said wall structure with their respective major planes in spaced parallel relationship; said fastening means comprising an elongate strip of material having a base portion, means for securing said base portion in abutting relation to said wall structure, and a web portion extending perpendicularly from said base portion and disposed intermediate the longitudinal edges thereof, stop means disposed intermediate said base portion and the free end of said web portion for spacing said wall panel from said wall structure, impaling means on said web portion adjacent the free end thereof and means formed in a major surface of said wall panel for receiving said impaling means for slidable movement in a plane parallel to said wall structure whereby said wall panel is retained in spaced parallel relation to said wall structure.

2. A building construction comprising a building wall structure, a decorative wall panel and fastening means

for securing said decorative wall panel to said wall structure with their major planes in spaced parallel relationship, said fastening means comprising a plurality of elongate strips of rigid material, each of said strips having a base portion and a web portion extending perpendicularly from said base portion and disposed intermediate the longitudinal edges thereof, said strips having their base portions secured in abutting relation to said wall structure, said strips being secured to said wall in spaced parallel relation, stop means on each of said strips disposed intermediate said base portion and the free end of said web portion for spacing said wall panel from said wall structure, impaling means on each of said web portions adjacent the free end thereof, parallel grooves formed in a major surface of said wall panel spaced apart a distance equal to the distance between said web portions for receiving said impaling means for slidable movement longitudinally thereof to retain said wall panel in spaced parallel relation to said wall structure but adjustable in a plane parallel thereto with said major surface abutting said stop means.

3. A building construction comprising building wall structure, a decorative wall panel and fastening means for securing said decorative wall panel to said wall structure with their respective major planes in spaced parallel relationship; said fastening means comprising an elongate strip of material having a base portion for securement in abutting relation to said wall structure, and a web portion extending perpendicularly from said base portion and disposed intermediate the longitudinal edges thereof, stop means disposed intermediate said base portion and the free end of said web portion for spacing said wall panel from said wall structure, impaling means on said web portion adjacent the free end thereof and groove means formed in a major surface of said wall panel for receiving said impaling means for slidable movement longitudinally thereof whereby said wall panel is retained in spaced parallel relation to said wall structure and adjustable in a plane parallel thereto.

4. A building construction comprising a panel of sheet material having a longitudinal elongate groove and a fastening device for securing said panel of sheet material to a building wall structure in spaced, parallel relation thereto, said fastening device comprising an elongate strip of material having a base member adapted to be secured to said building structure and an elongate web member perpendicular to said base member, impaling means disposed adjacent the free end of said web, said free end of said web member being received in said groove for slidable movement longitudinally thereof.

5. A building construction according to claim 4 wherein said fastening device includes an elongate flange disposed parallel to said base member and intermediate said impaling means and said base member to constitute a stop means for spacing said panel of sheet material at a fixed distance from said building wall structure.

6. A building construction according to claim 4 wherein said fastening device includes a pair of elongate flanges extending outwardly from said base in the direction of said free end of said web and disposed on opposite sides of said web to serve as stop means for spacing said panel of sheet material at a fixed distance from said building wall structure.

7. A building construction according to claim 4 wherein said base member includes a plurality of sharp pointed projections extending outwardly therefrom in a direction opposite said web member for securing said base member to said building wall construction.

References Cited by the Examiner

UNITED STATES PATENTS

751,373	2/1904	Brannon	84—14
1,237,344	8/1917	Klein	85—14
1,675,282	6/1928	Strand	85—14
2,066,205	12/1936	Keating	52—489
2,138,340	11/1938	Chemidlin	85—21
2,230,392	2/1941	Storms	85—14
2,325,766	8/1943	Gisondi	52—489
2,345,273	3/1944	Macklanburg	20—52.4 XR
2,390,929	12/1945	Ellis	85—21
2,509,037	5/1950	Flicker	52—614
3,007,213	11/1961	Hobbs	52—288

FOREIGN PATENTS

695,031	1930	France.
867,157	1953	Germany.
16,978	1892	Great Britain.
203,030	1923	Great Britain.
751,439	1956	Great Britain.
787,698	1957	Great Britain.

FRANK L. ABBOTT, *Primary Examiner.*

JACOB L. NACKENOFF, *Examiner.*

J. E. MURTAGH, *Assistant Examiner.*