Jan. 26, 1971 J. F. BLASKI 3,557,509

BUILDING PANEL CONSTRUCTION

Original Filed Feb. 14, 1967

Fig. 1

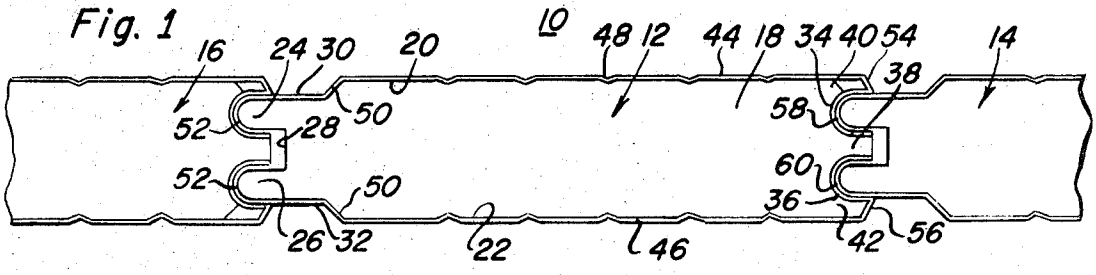


Fig. 2

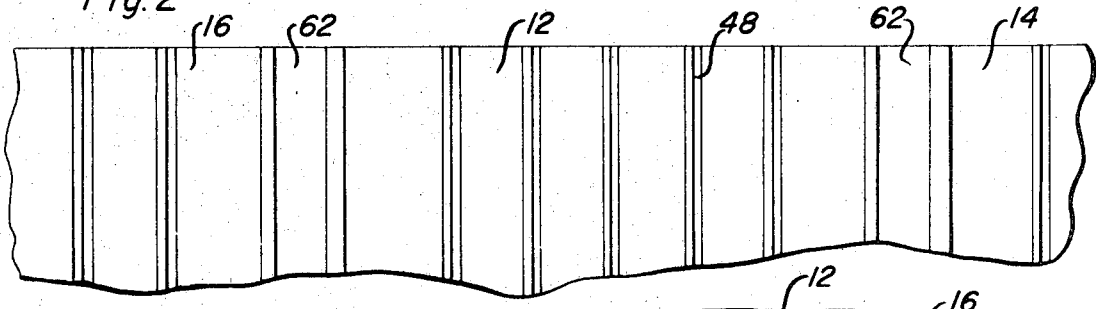
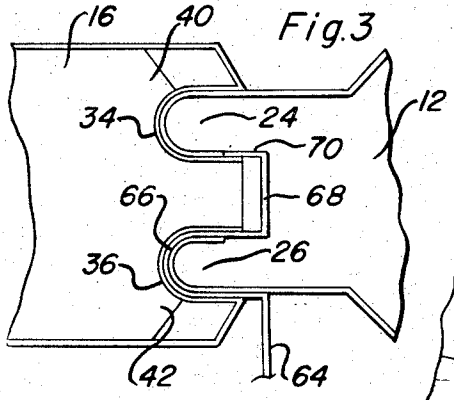


Fig. 3



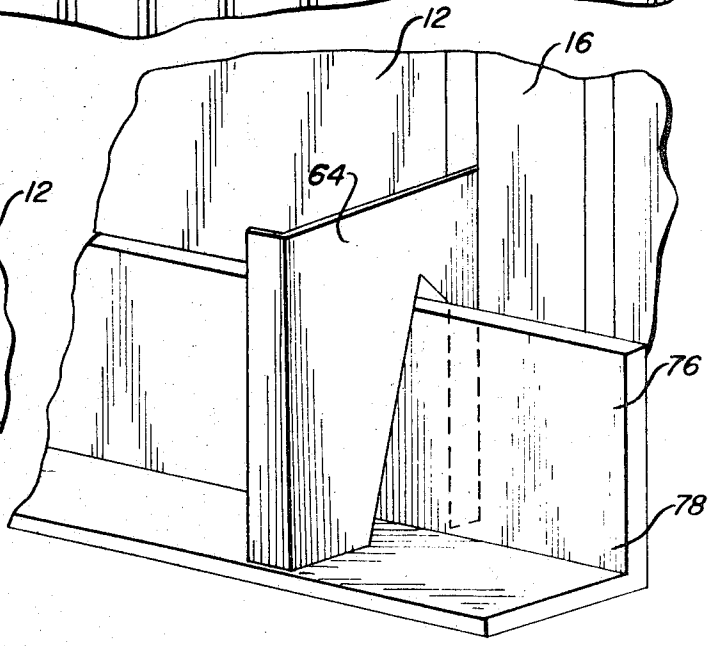


Fig. 4

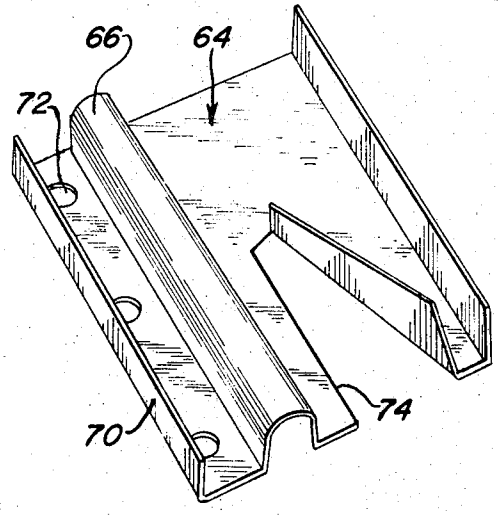


Fig. 5

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BUILDING PANEL CONSTRUCTION

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Continuation of application Ser. No. 615,982, Feb. 14, 1967. This application Nov. 5, 1968, Ser. No. 778,359
Int. Cl. E04b 1/90; E04c 1/10
U.S. Cl. 52—489 10 Claims

ABSTRACT OF THE DISCLOSURE

A building panel construction made up of a plurality of interlocked side-by-side planks. Each plank is a laminated construction including a self-sustaining core with shaped edges and cover sheets shaped to overlie the surfaces of the core and yieldably engage the edges thereof. The yieldable engagement is economical and provides an easy assembly procedure by virtue of the shapes of the edges. The panels are locked into an assembly with special clips which engage transverse members.

This is a continuation of application Ser. No. 615,982, filed Feb. 14, 1967.

This invention relates to an improved building panel construction and, more particularly, to a new laminated panel and a system for assembling such panels into an integrated wall.

Modern buildings, particularly buildings for industrial or commercial uses have required the utilization of new materials which provide wall panels having exterior durability with optimum thermal insulation and substantial strength. all at a minimum cost. The conventional masonry walls no longer satisfy these desiderata and thus the industry has sought new and better means for the construction of both large solid panels and panels with windows, doors and other openings disposed therein. One particular approach to this problem has been the manufacture of laminated panels having a core of soft insulating material with external hard surfaces to provide durability and strength. Such systems have often included outer covers of metal which are expensive to fabricate and assemble and are detrimental to the thermal characteristics of the building construction.

It is, therefore, one principal object of this invention to provide an improved building panel construction which may be simply and inexpensively assembled and will provide optimum physical characteristics.

It is another object of this invention to provide an improved building panel construction comprising a plurality of sections, each having an insulating core with resiliently secured hard surface covers thereon, each section being adapted to engage adjacent sections to provide a complete wall panel.

It is still another object of this invention to provide an improved building panel of laminated construction which may be readily assembled on a mass production basis without special or unique tools or fabricating techniques.

It is another object of this invention to provide a completely integrated, unitary building construction wherein a plurality of laminated panels having resiliently retained cover members may be assembled onto supporting members without the use of unusual tools and with a minimum of skill and training.

Further and additional objects of this invention will become manifest from a consideration of this description, the accompanying drawing, and the appended claims.

In one form of this invention a panel construction is provided wherein a plurality of panels are assembled in interlocking, side-by-side relationship and clipped to supporting horizontal members. Each panel is formed of a laminated construction comprising a foraminous or fibrous insulating core, having two metal cover means secured thereto to define the exterior and interior surfaces of the panel. The cover means are resiliently supported on the core and interlocked with the cover means of adjacent panels.

For a more complete understanding of the invention, reference will now be made to the accompanying drawings wherein:

FIG. 1 is a top plan view of a segment of a panel construction built in accordance with this invention;

FIG. 2 is a fragmentary elevational view of a panel construction according to FIG. 1;

FIG. 3 is a fragmentary view of one joint formed in a panel construction as illustrated in FIG. 1;

FIG. 4 is a fragmentary view of the mounting means for the panel construction of FIG. 1; and

FIG. 5 illustrates a clip employed in the embodiment of FIGS. 1–4.

Referring now to the drawings and, more particularly, to FIG. 1, a panel construction **10** is illustrated in fragmentary form including one panel section or plank **12** and fragments of adjacent sections **14** and **16**. Each plank or section should be identical and, in a typical embodiment, may be approximately 10 inches wide and of unlimited length. The length is determined, primarily, by the requirements of the building and the location of the supporting girts. Typically, the panels described herein are supported at approximately 10 foot vertical intervals, providing satisfactory strength for most installations. With such spacing, a panel construction in accordance with this invention will withstand 30 pounds of wind loading.

The panel **12** comprises a core **18** formed of an insulating material, preferably of perlitic nature. It may be an inorganic material generally described as fesco or tectum. The material is a lightweight, fibrous or particulate aggregate which is held together by a binder and provides excellent thermal insulation. It is also highly fire resistant and has sufficient strength and rigidity to function in the described invention. The core is formed with two substantially parallel surfaces **20** and **22**, which become the exterior and interior surfaces of the building construction. No further treatment of either surface is required when a building is constructed in accordance with the teaching of this invention.

Along one elongate edge of the panel **12**, the perlitic material **18** is formed with a pair of tongues **24** and **26**, which are coextensive and define a recess **28** therebetween. The outer surfaces **30** and **32** of the tongue portions **24** and **26** are depressed somewhat to form an inwardly disposed elongate surface for purposes to be described hereinafter.

The opposite edge of the perlitic core **18** is formed with a pair of grooves **34** and **36**, which define a central rib **38** therebetween. The central rib **38** extends outwardly beyond the extremes of the surface portions of the core. The extremes of the surface portions terminate in a pair of short tapered shoulders **40** and **42**. The shoulders are of a specific dimension and tapered for a purpose to be described hereinafter. The core **18** has a pair of cover means **44** and **46** disposed on the two major surfaces of the panel **12**. The covers **44** and **46** may be formed of sheet metal and, preferably, are formed of sheet aluminum or galvanized steel. In one embodiment of the invention, either steel or aluminum sheet of 28 gauge is employed and provides adequate resistance to marring and denting and sufficient strength for most industrial building constructions. It is preferred that the cover means **44** and **46** be rolled to provide a plurality of spaced parallel depressions **48** which add to the esthetics of the finished panel, serve

to conceal minor dents, scratches or other defacement of the panels and strengthens the panels. The outer surfaces of the cover means **44** and **46** may be enameled, or anodized, or colored; or decorated in any desired manner. All of the panels may be of the same color or if desired, a pattern of paneled sections may be employed to provide color highlights.

The end of each cover means **44** and **46** adjacent to the tongues **24** and **26** are formed to conform thereto. An angular offset **50** provides a depressed panel surface conforming to surfaces **30** and **32** which provide for the assembly of adjacent panels in a manner to be described. The cover means **44** and **46** are preformed with a curved portion **52**, which conforms to the shape of the tongues **24** and **26** and extends around the tongues a sufficient distance to entrap the tongue, strengthen it, and support the cover means thereon. The cover means **44** and **46** are cut so that they do not engage one another and, therefore, cannot provide thermal conduction between the two surfaces **20** and **22** covered thereby. Along the opposite edge of the panel **12** the metal cover means **44** and **46** are provided with extensions **54** and **56** which terminate at a point beyond the shoulders **40** and **42**. The cover means are then formed inwardly and back upon themselves to define a pair of grooves **58** and **60**. The grooved portions **58** and **60** of the cover means **44** and **46** conform to the grooves **34** and **36** formed in the perlitic core **18**. The dimensions of the shoulders **40** and **42** and the grooved portions **58** and **60** of the cover means **44** and **46** are carefully selected to facilitate assembly.

The individual panel sections are assembled as follows: The perlitic core **18** is first assembled and formed. The shape is readily formed with inexpensive tools in a milling type machine and cuts the two edges to form the tongues at one edge and the grooves at the other. At the same time, the angular formation of the shoulders **40** and **42** is provided. The cover means **44** and **46** are formed separately to the configuration illustrated, providing tongue covers **52** and grooves **58** and **60** with the somewhat resilient extensions **54** and **56** supporting the grooves **58** and **60**. It is thus a simple assembly operation to position the cover means **44** and **46** and the tongue covers **52** in engagement with the tongues **24** and **26** and force the opposite edges outwardly so that grooves **58** and **60** pass over the tapered shoulders **40** and **42** and into engagement with the grooves **34** and **36**.

Such an assembly has sufficient rigidity and strength for all subsequent operations. However, if desired, it is also possible to place a small amount of adhesive between the core **18** and the cover means **44** and **46**. Such adhesive is not essential to the teaching of this invention.

The principal advantages in the assembly of this new building panel construction are the ability to quickly assemble the cover means **44** and **46** upon the core **18** and provide resilient but positive retention of the parts. The construction described above is illustrated in partial elevation in FIG. 2. Therein the three panels **12**, **14** and **16** are illustrated in assembled relationship showing the esthetic nature of the depressions **48** and the nesting of the panels to form esthetic joint **62** therebetween.

The manner in which the panels are assembled to form a complete wall is best illustrated in FIGS. 3 and 4. The panels are supported by a small clip shown in perspective in FIG. 5. The clip **64** has a shaped portion **66** which conforms to the shape of the tongues **24** and **26**. When the tongues are forced into the adjacent grooves of a panel, a predetermined number of clips are placed therebetween and supported by the interlocking relationship of the tongues and grooves. As shown in FIG. 3, the clip **64** extends between the metal cover means of the panels such as panels **16** and **12** and is locked there by the interlocking engagement of the tongues **24** and **26** in the grooves **34** and **36**. The channel portion **66** of the clip extends into a transverse leg **68** and a small flange **70** rigidly locks the clip in place and abuts the two cover means **44** and **46**.

The small clips **64** constitute the only metallic interconnection between the two surfaces of the panel sections **12**. Thus, excellent thermal isolation is provided in the overall assembly. The clips **64** provide the minimum metal-to-metal contact necessary to insure structure integrity.

A plurality of apertures **72** are provided in the clips which may be used for locating the clips if desired. However, in the preferred assembly operation, the clip remains slidable between the panel sections so that a tapered slot **74** formed therein may engage the flange **76** of a horizontal, supporting member **78**. As discussed above, it is preferred that the horizontal supporting members form the basic grid structure of the building and that they be located at approximately 10 foot intervals. With such a construction, adequate rigidity is provided in the building so that no further re-inforcing or surface finishing of the walls is required. It will be obvious that many modifications and embellishments may be added to the basic disclosure described above. For example, the joints may be calked if desired, although such calking is not necessary in basic building constructions. The core material may be any thermally-insulating, foraminous or particulate, slightly yieldable material and the cover means may be metal, plastic or other appropriate rigid, thin material.

A major advantage of the invention over prior art constructions is the ability to assemble a laminated panel section or plank by merely snapping together a core and two covers to form a completed unit.

Without further elaboration, the foregoing will so fully explain the character of the invention that others may, by applying current knowledge, readily adapt the same for use under varying conditions of service, while retaining certain features which may properly be said to constitute the essential items of novelty involved, which items are intended to be defined and secured by the following claims.

What is claimed is:

1. An improved building panel construction comprising: a plurality of panels, each panel having a substantially homogeneous core of semi-rigid thermal insulation having two generally parallel panel surfaces, two elongate edges extending between said surfaces, two parallel spaced grooves formed longitudinally in one of said edges, a tapered shoulder disposed between each panel surface and the corresponding spaced groove, and two parallel spaced tongues formed in the other of said edges; two relatively rigid metallic cover means each having a surface generally corresponding to said panel surfaces, a channel formed along one elongate edge of each cover means and shaped to engage one of said tongues, an elongate clamp portion formed along the other elongate edge and shaped to correspond to said tapered shoulder and to the corresponding spaced groove, whereby said groove shaped portion may be resiliently snapped over said tapered shoulder to provide resilient engagement between said core and said cover means; said plurality of panels being mounted in side-by-side interlocking relationship and having clip means extending beyond the panel surfaces for mounting purposes, said clip means shaped to overlie one of said tongues, and partially overlie said second tongue, such that said cover means are locked in position and metallic connection between said cover means occurs only where the relatively small portion of said clip means partially overlies said second tongue.

2. The improved building panel construction of claim **1** wherein a recess is provided between said tongues and a rib is provided between said grooves, said recess and rib being complementary whereby a plurality of said panels may be assembled in edge to edge interlocking relationship.

3. The improved building panel construction of claim **1** wherein said building panel construction includes a plurality of generally horizontal support members, said panels are disposed vertically against said support members, and each of said clip means includes a generally

vertical slot, said clip means being slidable vertically in said groove to engage said horizontal support.

4. The improved building panel construction of claim 1 including a plurality of said panels in side-by-side interlocked relationship wherein said core is of reduced thickness adjacent said tongues and said cover means are shaped to conform thereto and define depressed elongate areas in the panel adjacent each of said tongues, said spaced tongues being disposed within said spaced grooves with the edge portion of said panel which defines said grooves extending outwardly and overlying said tongues and engaging said depressed areas, whereby said panels are substantially coplanar.

5. The improved building panel construction of claim 2 wherein said core extends outwardly along said surfaces to define shoulders partially overlying said rib, and said surfaces of said cover means extend outwardly beyond said shoulders and said panel extends inwardly to define said clamp portions which engage said grooves and are retained therein by said shoulders.

6. The improved building panel construction of claim 2 wherein said core and said clamp portions are sufficiently resilient to permit assembly thereof and retention of said clamp portion by said shoulder.

7. In a building panel construction comprising a plurality of panels disposed in side-by-side relationship, and interlocked by means of a double tongue and groove connection, each panel having a substantially homogeneous insulating core, a pair of relatively rigid metallic covers disposed opposite each other on the surfaces of said core, clip means extending beyond the panel surfaces for mounting purposes, said clip means shaped to overlie one of said tongues and partially overlie said second tongue, such that said covers are locked in position and metallic connection between said covers occurs only where said clip means partially overlies said second tongue.

8. An improved building panel construction comprising: a plurality of panels, each having a substantially homogeneous core of friable semi-rigid thermal insulation having two generally parallel panel surfaces, two elongate edges extending between said surfaces, two parallel spaced grooves formed longitudinally in one of said edges, a tapered shoulder disposed between each panel surface and the corresponding spaced groove, and two parallel spaced tongues formed in the other of said edges; two relatively rigid metallic cover means, each having a surface generally corresponding to one of said panel surfaces, resiliently snapped over said panel surfaces and engaging one of said spaced grooves and one of said spaced tongues; said plurality of panels arranged in side-by-side interlocking relationship and having clip means extending beyond the panel surface for mounting purposes, said clip means shaped to overlie one of said tongues and a relatively small portion of the other of said tongues, such that metallic connection between said cover means occurs only where the relatively small portion of said clip means partially overlies said second tongue.

9. The improved building panel construction of claim 8 wherein said semi-rigid metallic cover means having a surface generally corresponding to said panel surfaces includes a channel formed along one elongate edge of each cover means and shaped to engage one of said tongues, and an elongate clamp portion formed along the other elongate edge and shaped to correspond to said tapered shoulder and the corresponding spaced groove.

10. An improved building panel construction comprising: a plurality of panels, each panel having a substantially homogeneous core of semi-rigid thermal insulation having a substantially homogeneous core of semi-rigid thermal insulation having two generally parallel panel surfaces, two elongate edges extending between said surfaces, two parallel spaced grooves formed longitudinally in one of said edges, a tapered shoulder disposed between each panel surface and the corresponding spaced groove, and two parallel spaced tongues formed in the other of said edges; two relatively rigid metallic cover means each having a surface generally corresponding to said panel surfaces, a channel formed along one elongate edge of each cover means and shaped to engage one of said tongues, an elongate clamp portion formed along the other elongate edge and shaped to correspond to said tapered shoulder and to the corresponding spaced groove, said portion corresponding to said spaced groove being arcuate and having an inwardly directed bight portion to engage said tapered shoulder whereby said groove shaped portion may be resiliently snapped over said tapered shoulder to provide resilient engagement between said core and said cover means; said plurality of panels mounted in side-by-side interlocking relationship and having clip means extending beyond the panel surfaces for mounting purposes, said clip means extending a relatively short distance along said edges and engaging both of said tongues such that said cover means are locked in position and providing a metallic connection between said cover means only where said clip means overlies said tongues.

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