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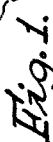
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3,195,699

INSULATED WALL CONSTRUCTION

Filed Jan. 8, 1962

2 Sheets-Sheet 1



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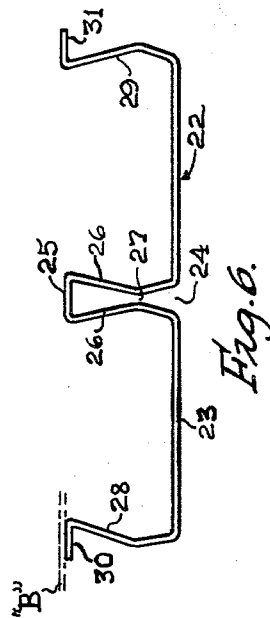
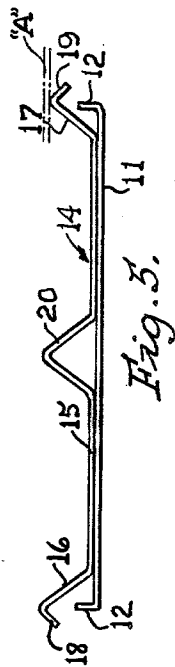
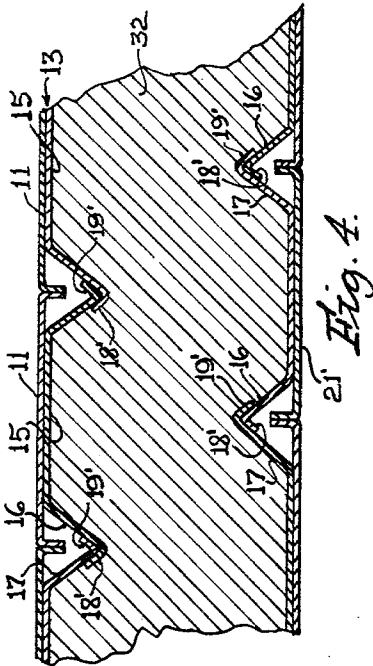
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INSULATED WALL CONSTRUCTION

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2 Sheets-Sheet 2



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3,195,699
INSULATED WALL CONSTRUCTION
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5 Claims. (Cl. 189—34)

This invention relates to a new and useful improvement in an insulated wall construction and more particularly to a self-supporting wall construction having an insulating metal bonding core.

A principal object of this invention is in the provision in a wall construction of this character of an arrangement of parts comprising exterior and interior wall panels bonded together by an inner core of synthetic insulating material so as to form an integral self-supporting wall section.

A further object of this invention is in the provision in a wall construction of this character of an arrangement of parts wherein the exterior and interior wall panels are provided with means which afford vertical stability and rigidity thereto so the same are self-supporting and capable of withstanding a great degree of stress and strain, yet requiring a minimum of thickness and weight.

Yet another object of this invention is in the provision in a wall construction of this character of a means for providing an enclosed space between an exterior wall panel that is rigid and self-supporting and an interior wall panel that is also rigid and self-supporting and the filling of this enclosed space with an insulating wall panel bonding material which then incorporates each of these panels into a solid core wall construction.

Still another and equally important object of this invention is in the provision in a wall construction of this character of an arrangement of parts that includes an inner insulating core and having an interior metallic wall surface that provides nail retaining grooves.

Other objects will appear hereinafter.

The invention consists in the novel combination and arrangement of parts to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings showing the preferred form of construction, and in which:

FIG. 1 is a detailed sectional view of the wall construction of this invention.

FIG. 2 is a front elevational view of the wall construction of this invention showing in dotted lines the structural formations provided by each panel of the wall structure.

FIG. 3 is a side elevational view of the wall construction of this invention.

FIG. 4 is a detailed sectional view similar to FIG. 1 but showing a modified form of construction.

FIG. 5 is an elevational view of one of the sectional units of the exterior wall panel, and

FIG. 6 is an elevational view of one of the sections of the interior wall panel.

It is the purpose of this invention to provide an insulated wall section that is of a minimum thickness and weight, yet self-supporting and provided with a great degree of vertical stability and rigidity. By this invention there is provided an insulated wall that may be utilized in building construction, refrigerated freight shipping vehicles, as well as general appliances that require an insulated wall.

A wall construction of any size or shape may be achieved through the employment of this invention without departing from the spirit and objects hereinbefore set forth. A partial wall section embodying this invention is generally shown as at 10 in FIG. 1. This wall section comprises a series of aligned exterior face plates 11.

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Each of these face plates 11 is provided at opposite ends with inwardly extending flanges 12. The corresponding flanges 12 of each of the face plates 11 are adapted to abut one another and be welded together so as to form a substantially flush exterior wall surface.

The inner surface of each face plate 11 intermediate the end flanges 12 thereof is adapted to lie in facial abutment with the outer surface of a plurality of exterior wall panels generally shown as at 13. These wall panels 13 comprise a series of interconnected sectional units 14; one of which is illustrated in FIG. 5. Each of these exterior wall sectional units 14 includes a substantially flat elongated body 15. The body 15 of each unit 14 terminates at each end into diverging flanges 16 and 17 with each flange 16 and 17 having its respective end portion 18 and 19 angled in opposite directions out of the plane of its respective flange. Thus each of the flanges 16 and 17 provides a V-shaped end which is offset with respect to the longitudinal length of the body 15. It should be noted that flange 16 is of a length slightly greater than flange 17 and thus its V-shaped end is displaced further inwardly of the longitudinal plane of the body 15, a distance equal to that indicated at "A" in FIG. 5, this for a purpose hereinafter made apparent.

When the exterior wall panel 13 is by necessity formed into an extensively wide unit as seen in FIGS. 1 and 5 only the extremities thereof need be formed for interlocking engagement as hereinafter explained. When such a wide panel is formed, however, there should be formed intermediate the interconnecting ends parallelly extending equally spaced V-shaped indentures such as is shown as at 20 in FIGS. 1 and 5. This structural configuration adds stability and rigidity to each of the wall panels 13 to make the same self-supporting.

An interior wall panel 21 is provided in spaced relation with respect to the exterior face plates 11 and exterior wall panels 13. This interior wall panel 21 comprises a plurality of prefabricated self-supporting wall sections 22 as shown in FIGS. 1 and 6. Each of the interior wall sections 22 comprises a flush body portion 23. This interior flush body portion 23 is formed to present throughout its longitudinal length a series of transversely extending nail receiving grooves 24. These nail receiving grooves 24 are formed by having the body 23 constructed so as to provide a substantially triangularly shaped impression having a base 25 which extends in a parallel plane to the flush surface of the body 23. The opposite legs 26 of such triangularly shaped impression converge to provide a restricted throat 27 for receiving and retaining a nail or the like inserted into the nail receiving groove 24. The opposite longitudinal edges of each of the interior wall sections 22 are so formed so as to provide only one complementary leg 28 and 29 for each of the endmost nail receiving grooves 24. Each of the complementary legs 28 and 29 provides a base portion 30 and 31 which extends in a parallel plane with respect to the flush body 23. The complementary leg 28 is of a length slightly less than the opposite complementary leg 29 so that the base 30 of such leg 28 is offset a distance equal to that indicated as "B" in FIG. 6.

The arrangement resulting from the construction of the interior wall panel 21 is that each interior wall section 22 is inner-connected by having the base 31 carried by the leg 29 at one edge of the interior wall section 22 placed over and in facial abutment with the base 30 of the associated leg 28 carried by the next succeeding interior wall section 22. As viewed in FIG. 1 the wall section 22 shown in its entirety is connected to associate wall sections 22 in the manner just described so that there are presented continuous equally spaced nail receiving grooves throughout the length of the entire interior wall panel.

As shown in FIG. 1, the exterior face plates 11 and the exterior sectional units 14 of the exterior wall panel 13 are related to the interior wall panel 21 in such a manner that the V-shaped ends are adapted to project inwardly toward the interior wall panel 21 intermediate the nail receiving grooves 24 of such interior wall panel 21. The flange 17 and its angular end 19 is placed over and in facial abutment with the flange 16 and its angled end portion 18 of the successive sectional unit 14. From the foregoing, it is clear that the exterior wall 13 as well as the interior wall 21 are self-supporting. The two wall panels are held in vertical spaced alignment and the space therebetween is filled with synthetic insulating material 32 in the form of polyurethane. This insulating material will bond itself to the inner surface of the exterior wall panel 13 as well as the inner surface of the interior wall panel 21 and thus become an insulated core bonding together the wall panels into an integral structure as seen in FIG. 1.

In the event that there is desired an interior wall surface that is flush rather than one presenting nail receiving grooves, such interior wall may be formed in the manner shown in FIG. 4.

In FIG. 4 the interior wall 21' is formed in the same structural manner as the exterior wall 13 shown in FIGS. 1 and 5. This interior wall 21' is installed in place of the nailable interior wall panel 21. In FIG. 4, I show the construction of a wall, the section units of which each have V-shaped end portions provided with over-lapping flanges 18' and 19' thus excluding the necessity of having an intermediate V-shaped indenture 20 as shown and described in FIGS. 1 and 5.

From the foregoing, it is evident that this invention provides an insulated wall construction that is self-supporting requiring the minimum thickness and weight while at the same time affording a great degree of vertical and horizontal stability and rigidity.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. A wall structure formed from aligned insulated wall panels,

- (a) each panel composed of a pair of spaced apart parallelly extending sheets of metallic material with the sheets of each panel secured along their longitudinal edges to corresponding sheets of adjacent panels to provide a continuous wall having inner and outer wall surfaces,
- (b) the wall surface of each sheet of each panel provided with longitudinally extending spaced apart ribs with the ribs of each sheet extending inwardly from its wall surface in the direction of the wall surface of the other sheet,
- (c) flanges provided by opposite longitudinal edges of each sheet of each panel,
- (d) said flanges of each sheet in mating relation with flanges of a confronting longitudinal edge of an adjacent sheet for continuously positioning and connecting the sheets of each adjacent panel together so that the inner and outer wall surfaces thereof are in alignment,
- (e) said mating flanges of each sheet cooperating to form end ribs equally spaced from the ribs formed in the surfaces of each sheet when each sheet of adjacent panels are connected along their longitudinal edge so as to form a continuous wall, and
- (f) a core of insulating material between said sheets

for bonding said sheets of each panel together throughout their length and width to form an insulated wall structure of spaced apart parallelly extending inner and outer wall surfaces.

2. A wall structure formed from aligned insulated wall panels,

- (a) each panel composed of a pair of spaced apart parallelly extending sheets of metallic material with the sheets of each panel secured along their longitudinal edges to corresponding sheets of adjacent panels to provide a continuous wall having inner and outer wall surfaces,
- (b) the wall surface of each sheet of each panel provided with longitudinally extending spaced apart ribs substantially triangular in cross section with the ribs of each sheet extending inwardly from its wall surface in the direction of the wall surface of the other sheet, with the ribs provided in the inner wall surface being offset longitudinally with respect to the ribs provided in the outer wall surface,
- (c) flanges provided by opposite longitudinal edges of each sheet of each panel,
- (d) said flanges of each sheet in mating relation with flanges of a non-corresponding confronting longitudinal edge of an adjacent sheet for continuously positioning and connecting the sheets of each adjacent panel together so that the inner and outer wall surfaces thereof are in alignment,
- (e) said mating flanges of each sheet cooperating to form end ribs equally spaced from the ribs formed in the surfaces of each sheet when each sheet of adjacent panels are connected along their longitudinal edge so as to form a continuous wall, and
- (f) a core of insulating material between said sheets and the ribs of each sheet for bonding said sheets of each panel and said mating flanges together throughout their length and width to form an insulated wall structure of spaced apart parallelly extending inner and outer wall surfaces.

3. A wall structure formed from aligned insulated wall panels,

- (a) each panel composed of a pair of spaced apart parallelly extending sheets of metallic material with the sheets of each panel secured along their longitudinal edges to corresponding sheets of adjacent panels to provide a continuous wall having inner and outer wall surfaces,
- (b) the wall surface of each sheet of each panel provided with longitudinally extending spaced apart ribs with the ribs of each sheet extending inwardly from its wall surface in the direction of the wall surface of the other sheet,
- (c) said ribs provided by the inner wall surface formed to provide nail receiving and retaining grooves extending in the direction of, but spaced from said sheet from which is formed the outer wall surface,
- (d) marginal flanges provided by opposite longitudinal edges of each sheet of each panel providing angled portions juxtaposed with respect to corresponding angled portions of marginal flanges provided by adjacent sheets for continuously positioning and connecting said sheets of each of said panels into a longitudinally extending wall,
- (e) said marginal flanges of each sheet cooperating to form end ribs providing a nail receiving and retaining groove equally spaced from the grooves formed in the surfaces of each sheet when each sheet of adjacent panels are connected along their longitudinal edge so as to form a continuous wall, and
- (f) a core of insulating material between said sheets for bonding said sheets of each panel together throughout their length and width to form an insulated wall structure of spaced apart parallelly extending inner and outer wall surfaces.

4. A wall structure formed from aligned insulated wall panels,
- (a) each panel composed of a pair of spaced apart parallelly extending sheets of metallic material with the sheets of each panel secured along their longitudinal edges to corresponding sheets of adjacent panels to provide a continuous wall having inner and outer wall surfaces,
 - (b) the wall surface of each sheet of each panel provided with longitudinally extending spaced apart ribs with the ribs of each sheet extending inwardly from its wall surface in the direction of the wall surface of the other sheet,
 - (c) said ribs provided by the inner wall surface formed to provide nail receiving and retaining grooves extending in the direction of, but spaced from said sheet from which is formed the outer wall surface,
 - (d) marginal flanges provided by opposite longitudinal edges of each sheet of each panel providing angled portions juxtaposed with respect to corresponding angled portions of marginal flanges provided by adjacent sheets for continuously positioning and connecting said sheets of each of said panels into a longitudinally extending wall,
 - (e) said marginal flanges of each sheet cooperating to form end ribs providing a nail receiving and retaining groove equally spaced from the grooves formed in the surfaces of each sheet when each sheet of adjacent panels are connected along their longitudinal edge so as to form a continuous wall,
 - (f) a core of insulating material between said sheets for bonding said sheets of each panel together throughout their length and width to form an insulated wall structure of spaced apart parallelly extending inner and outer wall surfaces,
 - (g) and a means carried by the outer wall surface which cooperates with a like means carried by the outer wall surface of an adjacent panel for forming a flush wall for said insulated wall panel.
5. A wall structure formed from aligned insulated wall panels,
- (a) each panel composed of a pair of spaced apart parallelly extending sheets of metallic material with the sheets of each panel secured along their longitudinal edges to corresponding sheets of adjacent panels to provide a continuous wall having inner and outer wall surfaces,
 - (b) the wall surface of each sheet of each panel provided with longitudinally extending spaced apart ribs with the ribs of each sheet extending inwardly from its wall surface in the direction of the wall surface of the other sheet,

- (c) said ribs provided by the inner wall surface formed to provide nail receiving and retaining grooves extending in the direction of, but spaced from said sheet from which is formed the outer wall surface,
- (d) marginal flanges provided by opposite longitudinal edges of each sheet of each panel providing angled portions juxtaposed with respect to corresponding angled portions of marginal flanges provided by adjacent sheets for continuously positioning and connecting said sheets of each of said panels into a longitudinally extending wall,
- (e) said marginal flanges of each sheet cooperating to form end ribs providing a nail receiving and retaining groove equally spaced from the grooves formed in the surfaces of each sheet when each sheet of adjacent panels are connected along their longitudinal edge so as to form a continuous wall,
- (f) said juxtaposed angled portions provided by the sheet forming the outer wall surface welded together to form substantially V-shaped structural ribs which extend in the direction of said nail receiving and retaining grooves formed in the inner wall surface and which V-shaped ribs are offset longitudinally with respect to said grooves to provide a self-supporting load bearing wall,
- (g) means carried by the sheet forming the outer wall surface which cooperates with a like means carried by a corresponding sheet of an adjacent panel for covering said V-shaped ribs so as to form a flush exterior wall surface for said panel, and
- (h) a core of insulating material between said sheets for bonding said sheets of each panel together throughout their length and width to form an insulated wall structure of spaced apart parallelly extending inner and outer wall surfaces.

References Cited by the Examiner

UNITED STATES PATENTS

1,574,586	2/26	Loucks et al.	189—34
1,880,453	10/32	Kantzler	189—34
2,184,113	12/39	Calafati	189—34
2,302,949	11/42	Palmer	189—34
2,907,417	10/59	Doerr	189—34
3,070,196	12/62	Switzgable	189—34

FOREIGN PATENTS

223,584 8/59 Australia.

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