Feb. 10, 1959 H. C. COX 2,872,710

CONSTRUCTION PANEL PROVIDING SOUND AND HEAT INSULATION

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FIG. 1.

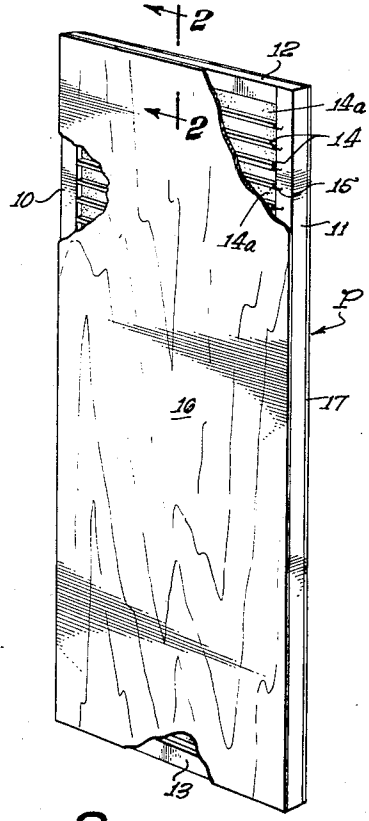


FIG. 2.

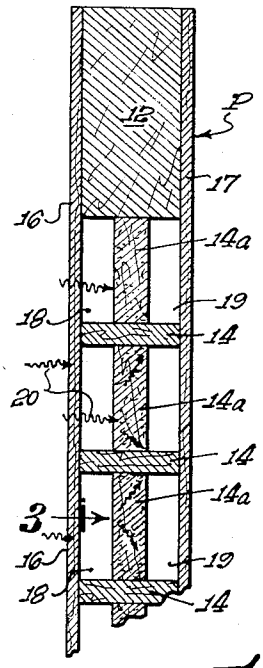


FIG. 3.

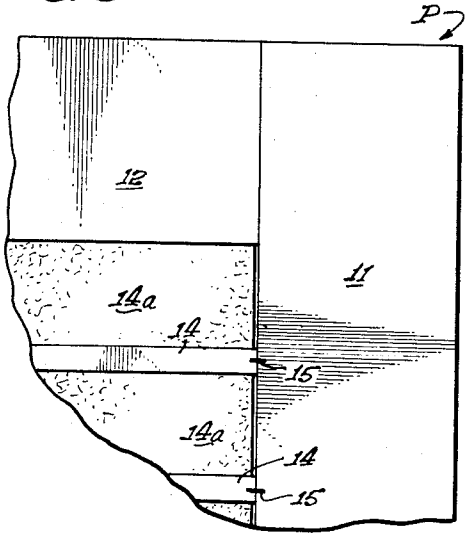
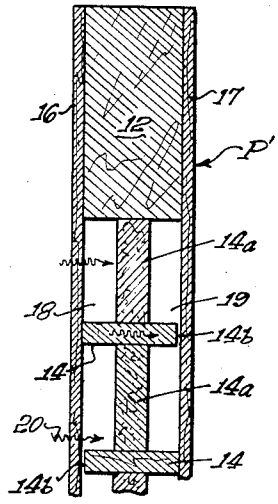


FIG. 4.



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CONSTRUCTION PANEL PROVIDING SOUND AND HEAT INSULATION

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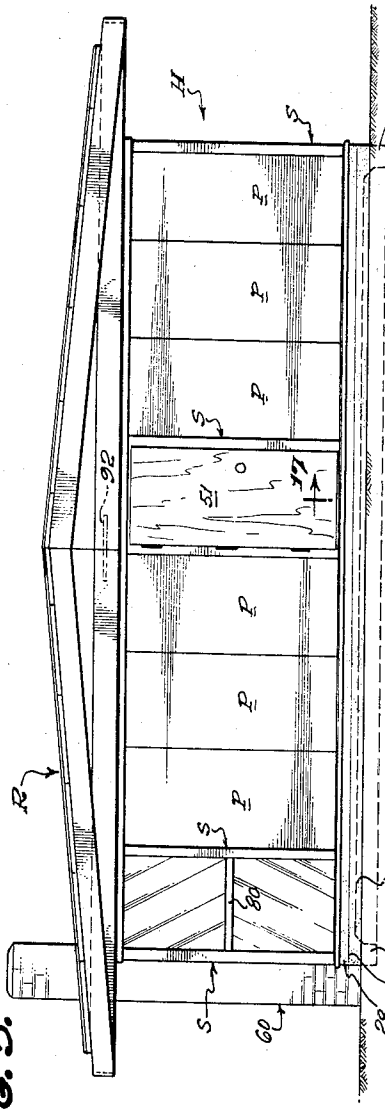

FIG. 5.

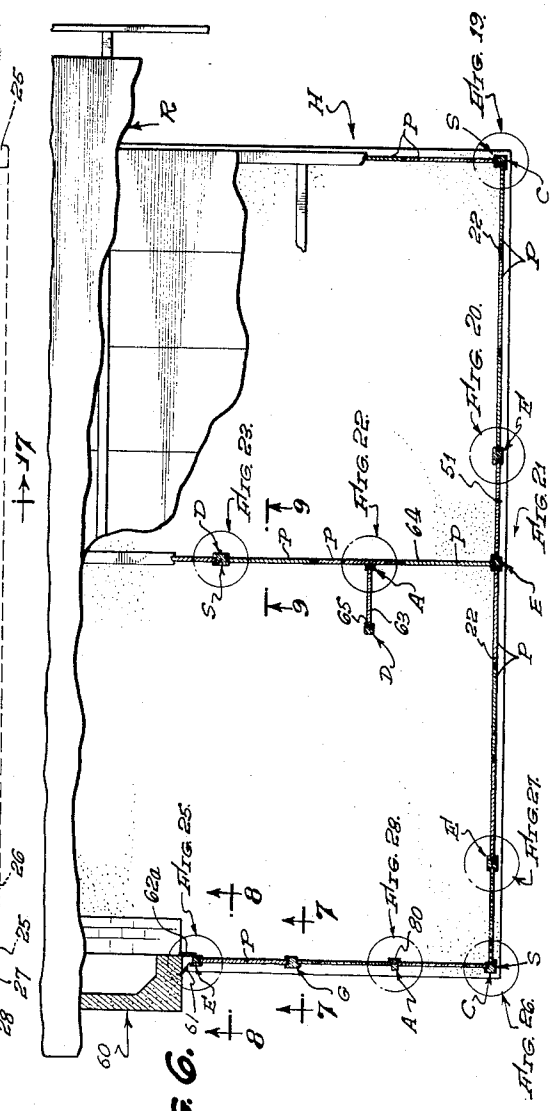

FIG. 6.

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FIG. 7.

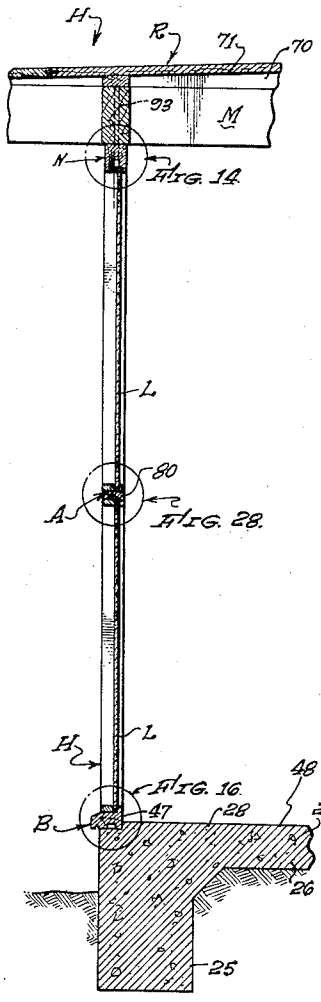


FIG. 8.

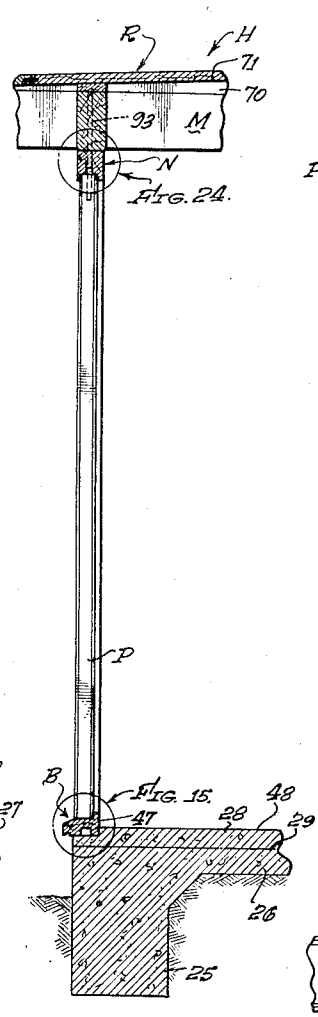


FIG. 9.

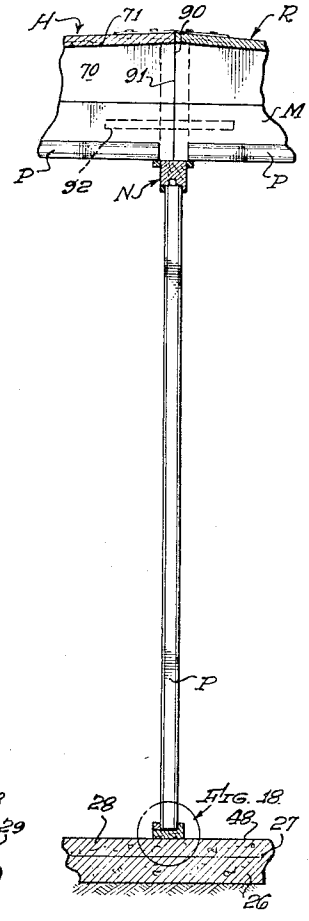


FIG. 25.

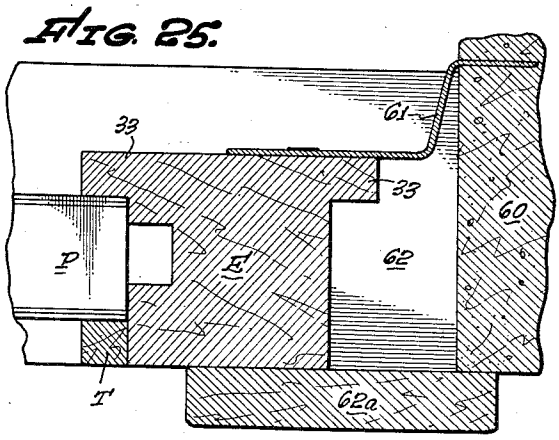
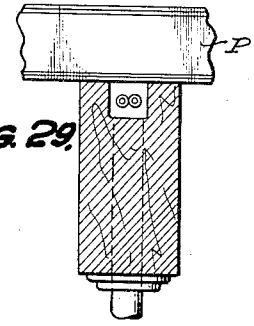


FIG. 29.



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CONSTRUCTION PANEL PROVIDING SOUND AND HEAT INSULATION

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FIG. 10.

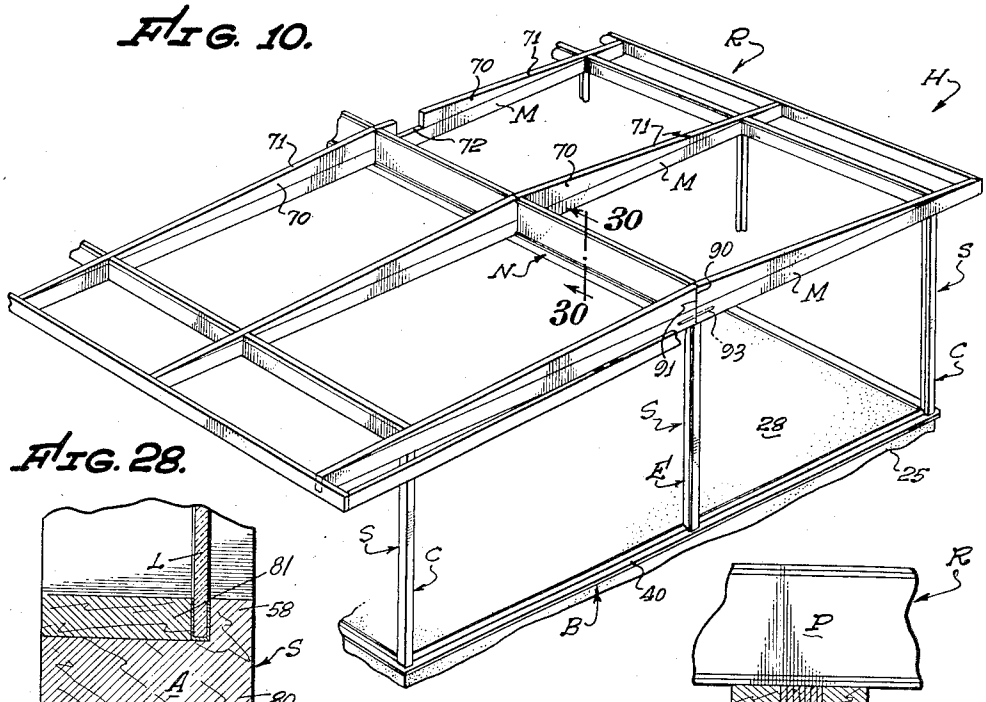


FIG. 28.

FIG. 27.

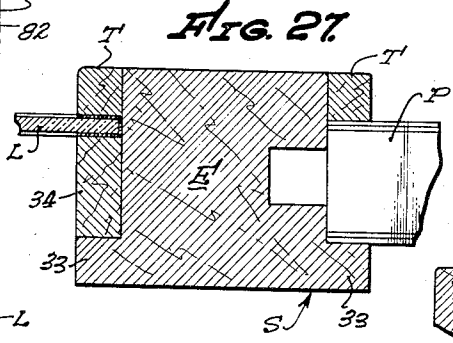


FIG. 30.

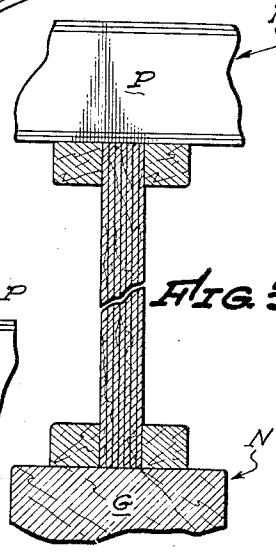
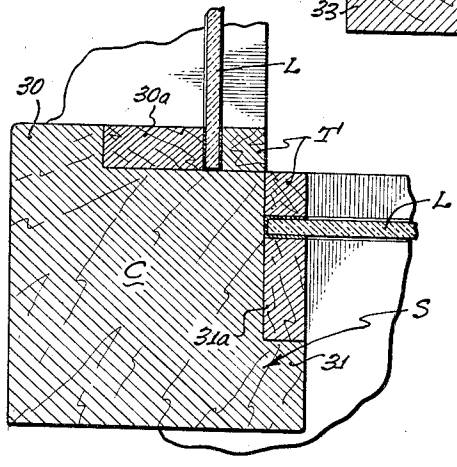


FIG. 26.



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CONSTRUCTION PANEL PROVIDING SOUND AND HEAT INSULATION

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FIG. 11.

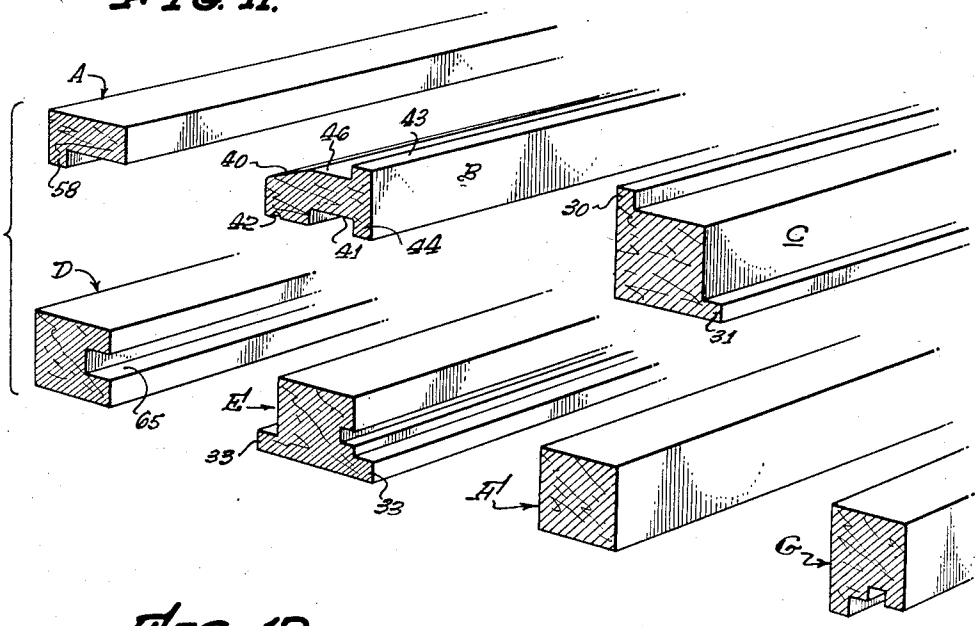


FIG. 12.

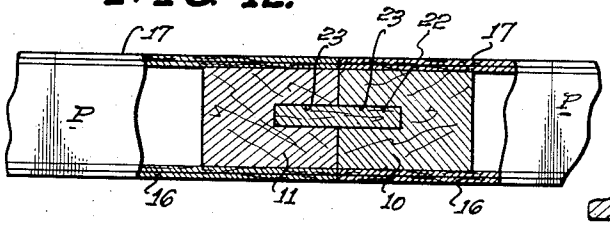


FIG. 13.

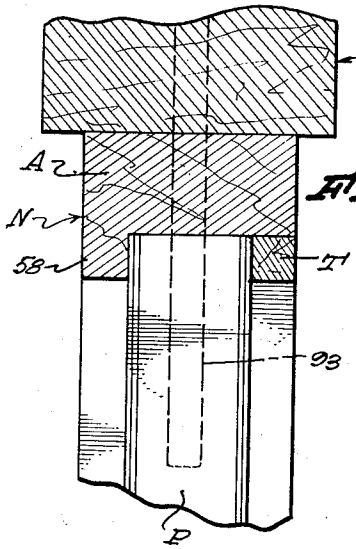
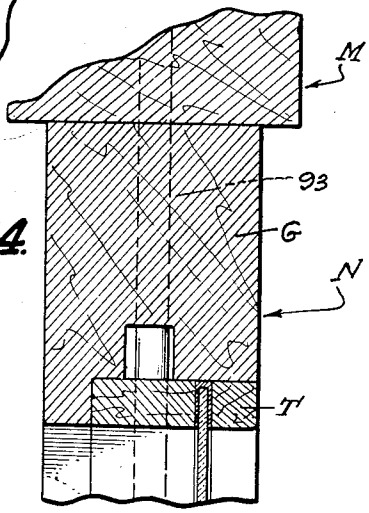


FIG. 14.



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CONSTRUCTION PANEL PROVIDING SOUND AND HEAT INSULATION

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FIG. 15.

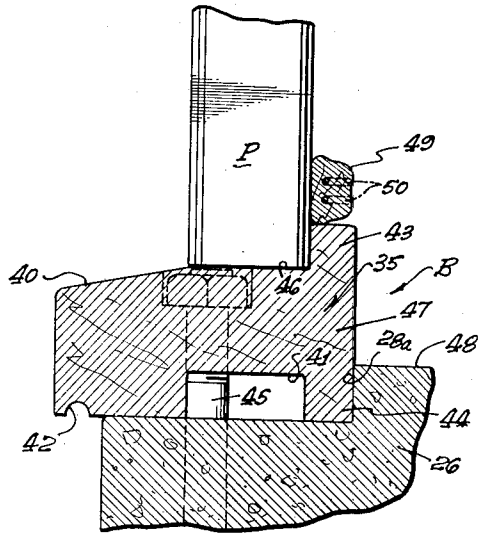


FIG. 16.

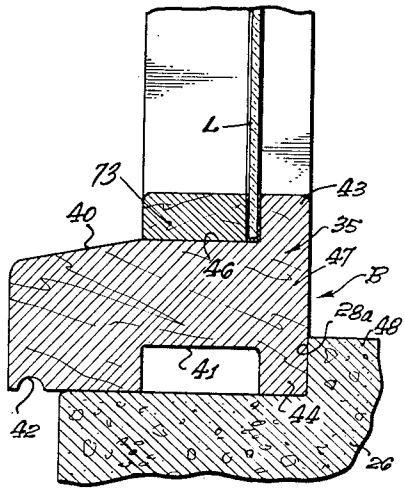


FIG. 17.

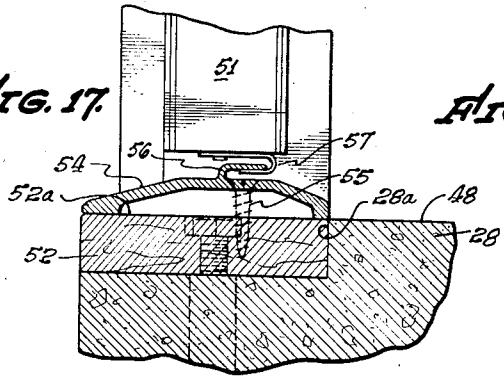
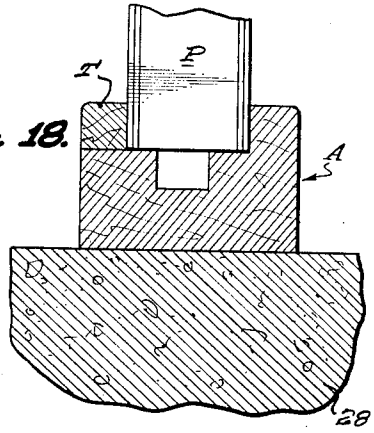


FIG. 18.



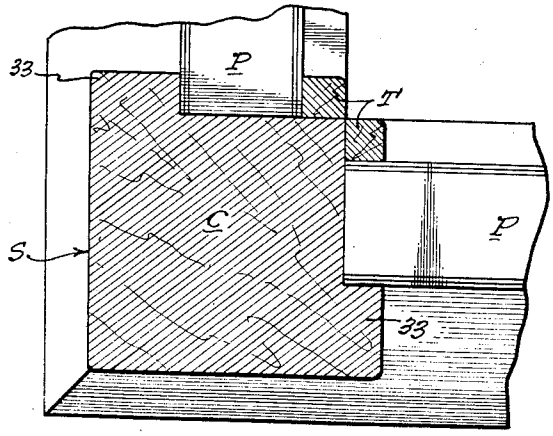


FIG. 19.

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CONSTRUCTION PANEL PROVIDING SOUND AND HEAT INSULATION

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FIG. 20.

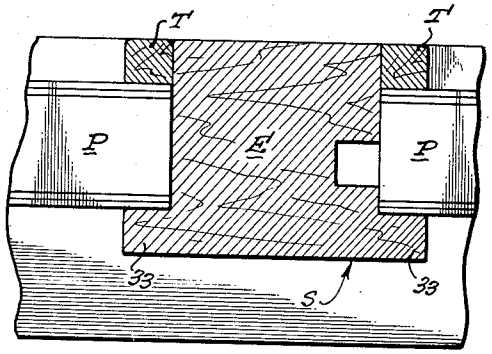


FIG. 21.

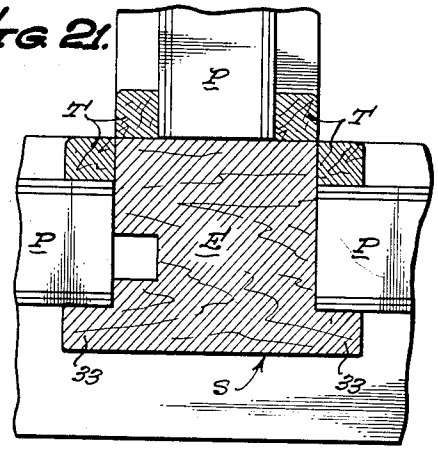


FIG. 22

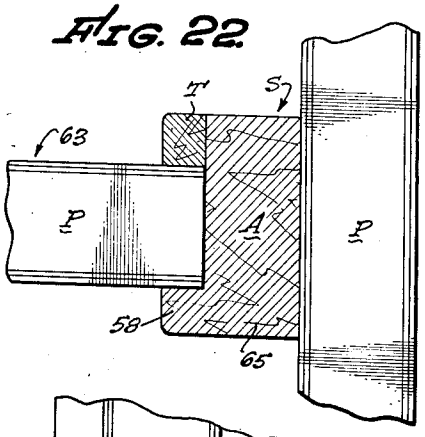


FIG. 23.

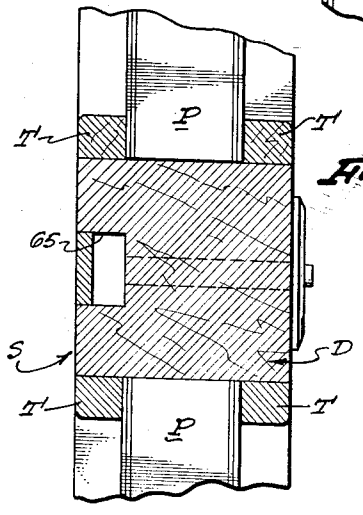
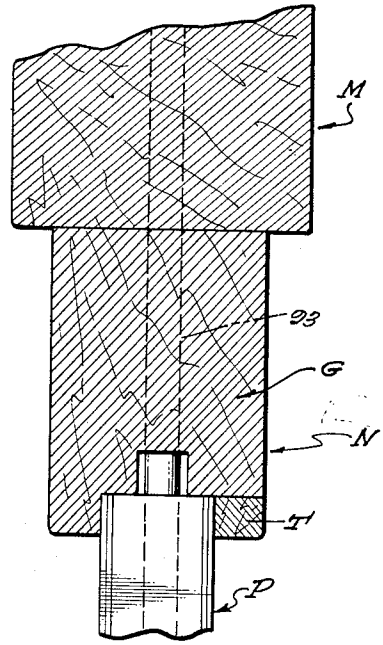


FIG. 24.



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United States Patent Office

2,872,710

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2,872,710

CONSTRUCTION PANEL PROVIDING SOUND AND HEAT INSULATION

Henry C. Cox, Garden Grove, Calif.

Application August 5, 1954, Serial No. 448,113

7 Claims. (Cl. 20—2)

The present invention relates generally to the construction of buildings, and more particularly to new and novel building panels, a structure fabricated with said panels, and a method of using said panels in the construction of a building.

A major object of the present invention is to provide a light-weight hollow panel that may be used in the fabrication of a wall structure which possesses exceptional physical strength and rigidity when utilized for this purpose, and provides excellent insulating qualities as to both sound and heat.

Another object of the invention is to supply a building panel of simplified structure that is fabricated from standard commercially available materials, requires no elaborate plant facilities in the manufacture thereof, and hence may be sold at a relatively low price.

A further object is to provide a prefabricated building panel and certain prefabricated structural elements that may be associated therewith to construct a building in accordance with an architect's or designer's floor plan, irrespective of whether said plan is or is not of a modular design.

Yet another object of the invention is to furnish prefabricated panels and structural elements therefor that are relatively light in weight, may be compactly assembled for shipment to any building site, can be erected in one-fourth the time required in the construction of present day buildings, is 100% stronger than modern houses comparable in price, requires the use of 80% less structural timber in the fabrication of buildings of any desired floor area, finish or layout, and embodies unusually high sound and heat insulating qualities.

A still further object of the invention is to provide a solution to present day high building costs by supplying prefabricated panels and structural elements particularly adapted for cooperative association therewith that may be easily assembled according to a predetermined plan by unskilled labor in a relatively short time to provide a house or building that in appearance, strength, and durability exceeds those costing thousands of dollars more which were constructed by highly skilled construction men.

A further object of the invention is to provide building panels and structural elements particularly adapted for the use of housing tract builders, in that the individual building foundations may be laid first, and the necessary panels and structural elements for each building delivered to the appropriate foundations for erection into a completely finished residence by semi-skilled labor without the necessity of on-the-job measuring, sawing and other costly time-consuming operations.

Yet another object is to supply building panels and cooperative structural elements therefor that in association provide a house or building in which the load is concentrated on spaced bearing posts, each of which is supported by an individual pier, with beams extending between said posts to provide a skeletal framework of exceedingly high strength and rigidity.

A further object of the invention is to provide building panels that may be interlocked together by novel means to form an integral wall section of the desired length, which wall section is capable of cooperative association with other wall sections in any desired configuration by means of one of a relatively small group of novel structural elements.

Another object of the invention is to supply a unique panel construction, the sill member of which may be utilized as either a mud sill or window sill.

A further object is to provide a house or building of panel construction in which all service lines, such as electrical wiring, plumbing pipes, and the like, are situated and completely concealed within the confines of longitudinally extending cavities formed in the bearing posts.

These and other objects and advantages of the invention will become apparent from the following description thereof when considered in conjunction with the drawings in which:

Figue 1 is a perspective view of a single building panel of the present invention with the upper right-hand portion broken away to show the interior structure thereof;

Figure 2 is a vertical cross-sectional view of the preferred form of panel taken on line 2—2 of Figure 1;

Figure 3 is an enlarged fragmentary elevational view showing in detail the interior structure of the panel taken on section line 3—3 of Figure 2;

Figure 4 is a vertical cross-sectional view of an alternate form of building panel;

Figure 5 is an elevational view of a residence embodying applicant's panels;

Figure 6 is a partial plan view of the residence shown in Figure 5, illustrating the wall structure thereof, and the manner in which the roof is supported;

Figure 7 is a vertical cross-sectional view of an exterior wall showing a window construction, taken on line 7—7 of Figure 6;

Figure 8 is a vertical cross-sectional view of an exterior wall structure taken on line 8—8 of Figure 6;

Figure 9 is a vertical cross-sectional view of an interior wall structure taken on line 9—9 of Figure 6;

Figure 10 is a partial perspective view of the framework of the residence shown in Figure 5;

Figure 11 discloses partial perspective views of the novel structural elements utilized in conjunction with the panels in the fabrication of a house as shown in Figures 5 and 6;

Figure 12 is a plan view showing the manner in which two adjoining panels are locked together;

Figure 13 is a vertical cross-sectional view of a panel and beam construction;

Figure 14 is an enlarged vertical cross-sectional detail of the beam and upper window portion shown in Figure 7;

Figure 15 is an enlarged vertical cross-sectional detail of the panel, mud sill, pier, and interior floor and wall construction shown in Figure 8;

Figure 16 is an enlarged vertical cross-sectional detail of the window, mud sill, pier, and interior floor and wall construction shown in Figure 7;

Figure 17 is an enlarged vertical cross-sectional detail of sill and lower portion of the door taken on line 17—17 of Figure 5;

Figure 18 is an enlarged vertical cross-sectional detail of the panel support shown in Figure 5;

Figure 19 is an enlarged horizontal cross-sectional detail of the corner post and engaging panels shown in the lower right-hand corner of Figure 6;

Figure 20 is a horizontal cross-sectional detail of the supporting post and two engaging panels shown in Figure 6;

Figure 21 is a horizontal cross sectional detail of the

exterior supporting post and three engaging panels shown in Figure 6;

Figure 22 is a horizontal cross-sectional detail of the interior supporting post and three engaging panels as shown in Figure 6;

Figure 23 is a horizontal cross-sectional detail showing an interior supporting post in engagement with two panels shown in Figure 6;

Figure 24 is a vertical cross-sectional view of a beam, the upper portion of a panel, and the member connecting same shown in Figure 8;

Figure 25 is a horizontal cross-sectional detail of the supporting post, engaging panel and flashing that extends to the fireplace shown in Figure 6;

Figure 26 is a horizontal cross-sectional detail of a supporting post and two engaging windows shown in Figure 6;

Figure 27 is a horizontal cross-sectional detail of a supporting post showing the manner of engagement thereof with a window and panel as shown in Figure 6;

Figure 28 is a horizontal cross-sectional detail of a supporting post in engagement with two windows as shown in Figure 6;

Figure 29 is a vertical cross-sectional detail of an interior beam showing the manner in which electrical wiring is concealed therein and a lighting fixture supported therefrom; and

Figure 30 is a vertical cross-sectional view of a beam taken on line 30—30 of Figure 10.

Referring to the drawings, it will be seen that the novel wall panel P illustrated in Figures 1–4, when utilized in the fabrication of a residence or building, provides the basic and unique feature of the invention. Each panel P is of the same height to permit interchangeability of use and in installation, but an equally important result attained is that the panels may be manufactured at the lowest possible cost inasmuch as height dimension is constant. Although all panels P are of the same height, the width thereof may vary. The reason for such variation will be apparent by an examination of Figures 5, 6 and 10 wherein it will be seen that the panels P of the house H are vertically disposed in groups to form a wall structure, with each group positioned between two bearing posts S.

The lowest cost construction would, of course be to have the bearing posts disposed with modular spacing, so that a given number of panels P of equal width would span the distance between the posts. Although modular construction may be desirable where economy rather than appearance is the all important factor, such construction seldom appeals to the individual buyer, as a residence so designed invariably has a box-like look.

In practice, a certain normal width for each panel of the present invention is established, at for example 3′–0″. The floor plan of the desired residence is then laid out, with the roof load being supported by beams, which beams in turn are maintained in the desired positions by a plurality of spaced bearing posts S. Spacing of the posts is determined not only by the load they are to support, but by the particular location thereof as well, in order that the posts will lend ornamentality to the completed structure. For example, in planning the layout of a house such as shown in Figure 5, it might be found that the desired floor space could best be provided by so spacing the supporting posts S that a 7′–4″ wall structure will span the distance therebetween. Obviously, the length of wall span would necessarily have to be custom built in a conventional building, but would not be economical in a typical modular construction. However, with the present invention such spacing between bearing posts makes no difference, for in ordering the panels for the residence or building the contractor need only specify two panels 2′–6″ wide and one panel 2′–4″ in width. The panels may then be set side-by-side and interlocked by means to be hereinafter described whereby the required 7′–4″ wall structure for the two supporting posts is provided. The normal panel width, of course, need not be 2′–6″, but could be 2′–8″ or any other width utilized in conventional door construction.

One of the major advantages of using panels of door width and height resides in the fact that numerous woodworking plants already in existence manufacture such doors so that there would be no production problem in securing the panels at minimum cost.

As may be seen in Figures 1–4, the detailed structure of panel P consists of a rectangular frame formed from two laterally spaced stiles **10** and **11** that are joined by a top member **12** and a bottom member **13**. Interspaced between members **12** and **13** are a number of parallel ribs or reinforcing strips **14** which in a door panel P of normal size are of rectangular cross section and approximately 5/16″ in thickness. The ends of ribs **14** abut against the interior surfaces of the stiles **10** and **11** and are preferably affixed thereto by staples **15**, it being understood that other fastening means may be used for this purpose if desired. Disposed between each pair of reinforcing ribs **14** is a strip of insulating material **14***a* such as Celotex or the like, the ends of which press against the interior surfaces of stiles **10** and **11** whereby strip **14***a* is frictionally secured in place. Celotex is a structural insulation fiber made from begasse by the Celotex Corp., 919 North Michigan Avenue, Chicago, Illinois.

Two rectangular sheets **16** and **17** of laminated wood or other suitable material are glued to the exterior surfaces of stiles **10** and **11**, top member **12**, and bottom member **13** to provide the panel shown in Figure 1. Formed as above described, a panel 6′–6½″ high, 2′–6½″ wide and 1⅜″ thick has been found by actual test to have a "U" factor of .34, and an allowable shear load of 810 pounds per lineal foot.

The high insulating value inherent in the panel construction of the present invention as to both sound and heat is derived from the formation of pockets **18** and **19** of dead air as shown in Figure 2. Sound waves indicated by undulant arrows **20**, first strike the sheet **16** and pass therethrough to pocket **18**. After traversing the width of pocket **18**, the sound waves strike the insulating strip **14***a* and are dispersed in the general direction indicated by the arrows in this figure. By such dispersion the sound wave are weakened in intensity during passage into pocket **19**, after which they strike the interior surface of sheet **17** where they are further weakened in passing therethrough. These numerous transitions of sound waves from one medium to another rapidly diminish their intensity, giving the panel P a high insulating value. The major portion of sound transmitted from one sheet **16** to the other sheet **17** is that sound which passes through the reinforcing ribs **14**. The remarks made herein relative to sound are equally applicable to the heat insulating qualities of the panel. In actual tests a panel of 1⅜″ thickness was found to have a "U" factor of .34.

The amount of sound transmitted through the panel P may be drastically reduced by use of the alternate structure P′ shown in Figure 4. In this alternate form only one of the vertical sides of each reinforcing rib **14** actually contacts the interior surface of one of the sheets **16** or **17**, and as a result the passage of sound waves therethrough is further impeded by the additional air spaces **14***b* formed between the ends of ribs **14** and the interior surfaces of sheets **16** and **17**. Where high insulation qualities in a panel is not of paramount importance, the preferred form of panel as shown in Figures 1 to 3 is the most advantageous to use inasmuch as it is physically much stronger than the alternate form. In utilizing the present invention in the fabrication of a house or building, a separate pier **25** is provided for each bearing post S. Such piers **25** are joined by a concrete pad **26** that is applied to the surrounding leveled

ground surface, and a film or sheet of waterproof material **27** is overlaid on the upper surface of the pad **26**. A finished concrete floor **28** is then poured over the waterproof covering on pad **62** and after setting as in the form shown in Figures 7–10.

When a large number of houses are to be built, as in a real estate tract where the houses follow a somewhat basic floor plan, it is frequently desirable to lay out the locations of the bearing posts S and piers **25** by means of a template. By establishing the positions of the supporting posts in this manner, accurate spacing measurements are obtained, the desirability of which will be hereinafter outlined in detail.

Each of the bearing posts S embodied in the house illustrated in Figure 6 is shown in enlarged perspective in Figure 11 and identified as structural members A to G. At the lower left-hand corner of the plan shown in Figure 6, it will be seen that structural member C is used as a bearing post, the details of which may be seen in Figure 26. Member C is of substantially square cross section having two longitudinally extending ribs **30** and **31** extending outwardly therefrom, and is engaged by two glass panes L of the windows as shown in Figures 5 and 6. The adjacent vertical edge portions of panes L are disposed between elongate strips **30***a*, **31***a* and two elongate stops T which hold said panes in rigid position relative to member C (Figure 26). Strips **30***a*, **31***a* and stops T are affixed to member C by conventional means (not shown) such as nails or the like.

The next exterior supporting post to the right of the above-described member C in Figure 6 is formed from member E of Figure 27. Member E is of substantially rectangular cross section, and has two oppositely disposed elongate ribs **33** extending outwardly therefrom. As may best be seen in Figure 27, a panel P abuts against one side of member E and is firmly held in position relative thereto by one of the vertical edge portions of the panel, which vertical edge is gripped between one of the ribs **33** and an elongate stop T affixed to the member. One edge of pane L is positioned adjacent that vertical surface of member E against which panel P abuts, and strip **34** and stop T affixed to the member cooperatively grip pane L in secure abutment against member E and in vertical alignment with the inner surface of panel P. This bearing post construction is utilized in the transition from panel to glazing of an exterior wall.

Extending to the right from member E are three panels P locked by dowel strips **22** slidably inserted in vertically aligned slots **23** formed in the outer portions of stiles **10** and **11** whereby said panels form a rigid integral unit (Figure 12). This three-panel wall section terminates in a bearing post formed from a member E which has been modified in order to enable the member to engage two oppositely disposed exterior panels and a normally positioned interior panel, as shown in detail in Figure 21. The edges of these exterior panels P are gripped between ribs **33** and stops T. One edge of the interior panel abuts against the innermost face of member E and is held in fixed position relative thereto by the gripping action of two stops T affixed to the member.

A wooden mud sill **35** formed from the member B shown in Figure 11 rests on the foundation and extends between the bearing posts previously described. The foundation referred to is formed by piers **25**, and the outer portions of pad **26** and floor **28** extending therebetween. Member B is irregular in transverse cross section particularly characterized by a downwardly tapered sill surface **40**, a first longitudinally extending groove **41** of rectangular cross section, a second longitudinal groove **42** of semi-circular cross section, and two projecting ribs **43** and **44**. The arrangement of member B when serving as a mud sill is best seen in Figure 15. It will be particularly noted that the floor **28** terminates in an angular recess **28***a* into which a part of the lower portion of sill **35** fits.

A number of longitudinally spaced, vertical threaded rods or bolts **45** engage the mud sill and are embedded in the concrete foundation to hold the sill in place thereon. The lower edges of the panels P rest on the horizontal upper face **46** of the sill in the same manner shown in Figures 8 and 15, with the lower inner vertical surface of the sill abutting against the exterior vertical surface of rib **43**. It will be noted that when so positioned the mud sill provides a molding **47** that extends above the upper surface **48** of the floor **28**. A length of wire mold **49** may be disposed on the upper surface of rib **43** adjacent the interior face of panel P, with leads (not shown) extending from wires **50** in the wire mold to convenient outlet sockets.

A door **51** is shown in Figure 5, the detailed structure of which may best be seen in Figure 17. A panel P may be utilized as a door **51**, but for the sake of clarity herein has been assigned an identifying numeral. On those sections of the foundation above which a door is to be installed, the mud sill member B is omitted and a wooden strip **52** (Figure 17) substituted therefor. It will be noted that the upper surface **52***a* of the strip is flush with the upper surface **48** of the floor. A generally convex concave elongate metallic sill member **54** is affixed to strip **52** by screws **55**, which sill member has an inwardly disposed engageable hook-like member **56** situated on the upper portion thereof. Member **56** is adapted to engage with a hook-like engaging member **57** that depends from the lower edge of door **51**, whereby when in engagement members **56** and **57** will provide a weather-tight seal.

The bearing post to the right of door **51** is a member E, the details of which when used in this manner are shown in Figure 20. It will be noted that rib **33** on the left of member E serves as a stop for door **51**, and that the rib **33** and stop S on the right-hand side of the member grips one vertical edge of a panel P to support it in a fixed upright position.

In Figure 19 the detailed structure of the bearing post located in the lower right-hand corner of the building illustrated in Figure 6 is disclosed. One of the structural members C is used for this purpose, with panels P situated at right angles to one another and the edge portions thereof are gripped between ribs **33** and stops T.

The manner in which a partition **63** may be joined to an interior wall **64** is shown in Figures 6 and 22. One of the structural members A which is of generally rectangular cross section and has a projecting rib **58** is employed. Structural member A is positioned to form a part of wall **64**, with the rib **58** extending outwardly from the wall so formed and normal thereto. Partition **63** is disposed at a 90° angle to the interior wall **64** and one edge portion of the partition is gripped between the rib **58** and a stop T affixed to the structural member A in the manner previously described. The termination of the partition wall may be effected by use of a structural member D as shown in Figure 11, which member is formed with a longitudinally extending slot **65** that engages the free vertical end portion of the outermost panel in the partition.

To effect a transition from the panel wall structure to a brick construction such as the fireplace **60** shown in Figure 6, the detail shown in Figure 25 may be employed. In this detail it will be noted that structural member E is used and spaced from the fireplace to reduce the hazard of fire. The panel P terminating adjacent the fireplace is engaged on the free vertical edge portion by one of the ribs **33** and stop T mounted on member E. A sheet of metallic flashing **61** of a generally Z-shaped cross section extends from member E to a position in contact with the fireplace to effect a weather-tight seal therewith. The air gap **62** formed between the fireplace and member E is concealed by a substantially rectangular wooden

sheet 62a that overlaps the adjacent interior edge portions of both the fireplace 60 and member E.

As may be seen in Figure 5, panels P are of substantially door height. In Figures 5, and 7 to 9 inclusive, it will be seen that the panels extend upwardly from structural member B that serves as a mud sill to the lower surfaces of rafters M and plates N which are rigidly maintained in predetermined elevated position on the upper ends of the bearing posts S. The roof load in this novel building structure is borne entirely by the rafters, plates, and bearing posts, and due to the interlocking of panels P between the spaced bearing posts, the only force to which the panels may be subjected is that of a side thrust or force directed against the wall-forming surfaces thereof. As previously described in detail, due to their construction the panels P are capable of taking a shear load of far greater magnitude than will be required when they are installed in a building.

In Figures 5 and 10 it will be seen that a roof R is provided that tapers downwardly slightly from each side of the longitudinally extending center line of the building. The space between the upper edges of the rafters M and the downwardly disposed surface of the roof R is filled by vertically positioned sheets 70 of wood or other suitable material, having tapered roof-engaging upper edges 71. Rectangularly shaped notches 72 are cut in sheets 70 through which ducts (not shown) may be extended to permit complete air conditioning of the building.

The roof R of the building shown in Figures 5 and 6, is formed by laying the panels P in side-by-side relationship to form a continuous surface, with the under side end portions of the panels supported by the rafters M and space-filling members 70 associated therewith. In the particular building shown in Figures 5, 6 and 10, the panes L of the windows are held in fixed stationary position in the manner shown in Figures 7, 16, 26, 27 and 28. Such a construction results in a considerable saving as the need for conventional sash is eliminated, which savings offset to a degree the increased cost of a building equipped with complete air conditioning equipment.

An important structural feature of the present invention is the use of the structural member B as a mud sill, for such use permits the glass window panes L to be extended downwardly to substantially floor level as shown in Figure 16 of the drawings. The lower edge of the pane L rests on the surface 46 of the mud sill and is gripped between the confronting vertical surfaces of rib 43 and of an elongate wooden strip 73 affixed to the sill by conventional means. Groove 42 formed in structural member B prevents inward movement of water or mois ture by capillary action toward a position between the mud sill and foundation. Were water and moisture permitted to enter the horizontal minute space existing between the contacting surface of structural member B and foundation, the wooden structural member would rot out in time.

Several alternate forms of window construction may be incorporated in a building if desired. When it is desired to form a window having an upper and a lower panel L, as shown on the extreme left in Figure 5, the horizontal window transom bar and mullion 80 shown in Figure 28 may be utilized. The mullion is formed by placing one of the structural members A at the desired elevation with the rib 58 extending upwardly and inwardly disposed. The upper pane L has the lower edge thereof resting on the upper horizontal face of the member, with the lower portion gripped between the rib 58 and an elongate strip 81 of rectangular cross section that is affixed to the member. A stop T and a second strip 82 affixed to the lower horizontal surface of transom bar 80 grip the lower pane L and hold it in fixed stationary position.

Should it be desired, the structural member B used as a mud sill, may also be employed as a sill for a window located in the upper portion of one of the panels P. When so employed, the upper portion of the panel P may be slidably inserted within the confines of the groove 41 shown in Figure 16.

In Figure 9 it will be seen that each rafter M may be formed from two abutting portions 90 and 91 that rest on an interiorly positioned bearing post S, and are so maintained by a rigid horizontally disposed pipe 92 that engages both portions.

To assure that the plates N will remain in position on the exterior bearing posts S, the upper portions of which are engaged by dowels 93 extending downwardly through the plate.

The building panels, a building embodying the use thereof, and the method by which said building may be fabricated have been described in detail herein and need not be repeated.

Although the panels, building, and method of fabricating said building are fully capable of achieving the objects and providing the advantages heretofore mentioned, it is to be understood that they are merely illustrative of the presently preferred embodiment of the invention and that I do not mean to be limited to the details of construction herein shown and described other than as defined in the appended claims.

The invention claimed is:

1. A rectangular structural member which includes: a rigid frame defined by two parallel, laterally spaced stiles, and an upper rail and a bottom rail joined to the ends of said stiles; two rectangular panels of rigid sheet material that are affixed to opposite sides of said frame; a plurality of parallel vertically spaced, horizontal rigid reinforcing ribs disposed within the confines of said frame and extending between the inner surfaces of said stiles, with the vertical surface portions of said reinforcing ribs contacting but one of the inner surfaces of said panels; means that affix the ends of said ribs to said stiles; and a plurality of strips of insulating material extending between said stiles but spaced out of contact with said panels, with each of said strips contacting at least one of said reinforcing ribs.

2. A rectangular structural member which includes: a rigid frame formed from two parallel, laterally spaced stiles, and an upper rail and a bottom rail connected to the end portions of said stiles; two rectangular panels of rigid sheet material that are affixed to opposite sides of said frame; a plurality of parallel, vertically spaced, horizontal rigid reinforcing ribs disposed within the confines of said frame and extending between the inner surfaces of said stiles, with the vertical surface portions of said reinforcing ribs contacting but one of the inner surfaces of said panels; means that maintain the ends of said ribs in fixed position relative to said stiles; and a plurality of strips of sound insulating material, each of which is of transverse rectangular cross section and of a width less than that of said reinforcing ribs, each of said insulating strips disposed within the confines of said frame and extending between the inner surfaces of said stiles but spaced out of contact with said panels, and with at least one face of said insulating strips contacting one of said reinforcing ribs.

3. A rectangular structural member which includes: a rigid frame formed from two parallel, laterally spaced stiles, and an upper rail and a bottom rail connected to the end portions of said stiles; two rectangular panels of rigid sheet material that are affixed to opposite sides of said frame; a plurality of parallel, vertically spaced, horizontal rigid reinforcing ribs disposed within the confines of said frame and extending between the inner surfaces of said stiles, with the vertical surface portions of said reinforcing ribs contacting but one of the inner surfaces of said panels; means that maintain said reinforcing ribs in fixed spaced position relative to said stiles and panels; and a plurality of strips of sound insulating material of rectangular transverse cross section disposed between said reinforcing ribs and extending substantially the distance between said stiles, said strips being of lesser

width than that of said reinforcing ribs and intermediately spaced between said panels.

4. A rectangular structural member which includes: a rigid frame formed from two parallel laterally spaced stiles, and an upper rail and a bottom rail that are joined to the end portions of said stiles; two rectangular panels of rigid sheet material that are affixed to opposite sides of said frame; a plurality of parallel, vertically spaced, horizontal rigid reinforcing ribs disposed within the confines of said frame and extending between the inwardly disposed surfaces of said stiles, with the vertically disposed surface portions of said reinforcing ribs contacting but one of the inner surfaces of said panels; metallic means that engage said stiles and said reinforcing ribs to maintain said ribs in predetermined position relative to said panels and stiles; and a plurality of strips of compressible sound insulating material of rectangular transverse cross section disposed between said ribs and extending substantially the distance between said stiles, said strips normally being greater in height than the spacing between adjacent faces of ribs and narrower in width than that of said ribs, said strips being intermediately spaced between said panels and so held in position by frictional contact with the engaging faces of said ribs.

5. A rectangular structural member which includes: a rigid frame formed from two parallel laterally spaced stiles, and an upper rail and a bottom rail that are joined to the end portions of said stiles; panels of rigid sheet material that are affixed to opposite sides of said frame; a plurality of parallel, vertically spaced, horizontal rigid, reinforcing ribs disposed within the confines of said frame and extending between the inner surfaces of said stiles, with the vertical side portions of said ribs contacting but one of the inner surfaces of said panels; a plurality of drivable metallic members that engage said stiles and ribs to maintain said ribs in predetermined positions relative to said panels and stiles; and a plurality of sound insulating strips of transverse rectangular cross section narrower in width than that of said ribs and extending substantially the distance between the inner faces of said stiles, said insulating strips being positioned between said ribs and intermediately spaced between said panels with said insulating strips so held in said positions by frictional contact with said ribs.

6. A rectangular structural member which includes: a rigid frame formed from two parallel laterally spaced stiles and an upper rail and a bottom rail that are joined to the end portions of said stiles; two rectangular panels of rigid sheet material that are affixed to opposite sides

of said frame; a plurality of parallel, vertically spaced, horizontally disposed rigid reinforcing ribs of rectangular cross section, said ribs of less width than the horizontal spacing between the interior surfaces of said panels, and said ribs alternately arranged with the side of one rib in contact with one of said panels and the opposite side of the next of said ribs in contact with the opposite of said panels; means that affix each of said ribs to said stiles to maintain said spaced relationship; and a plurality of strips of insulating material extending between said stiles but spaced from contact with said panels, with each of said insulating strips in contact with at least one of said ribs.

7. A rectangular structural member which includes: a rigid frame formed from two parallel laterally spaced stiles and an upper rail and a bottom rail that are joined to the end portions of said stiles; two rectangular panels of rigid sheet material that are affixed to opposite sides of said frame; a plurality of parallel, vertically spaced, horizontally disposed, rigid reinforcing ribs of rectangular cross section, said ribs of less width than the horizontal spacing between the interior surfaces of said panels, and said ribs alternately arranged with one side of a rib in contact with one of said panels and the next of said ribs in contact with the opposite of said panels; means that affix each of said ribs to said stiles to maintain said spaced relationship; and a plurality of strips of sound insulating material of rectangular transverse cross section disposed between said ribs and extending substantially the distance between said stiles, said insulating strips of less width than the width of said ribs, and said insulating strips intermediately spaced between said panels.

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