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Lindal

(54) **PREFABRICATED GLASS HOUSE**

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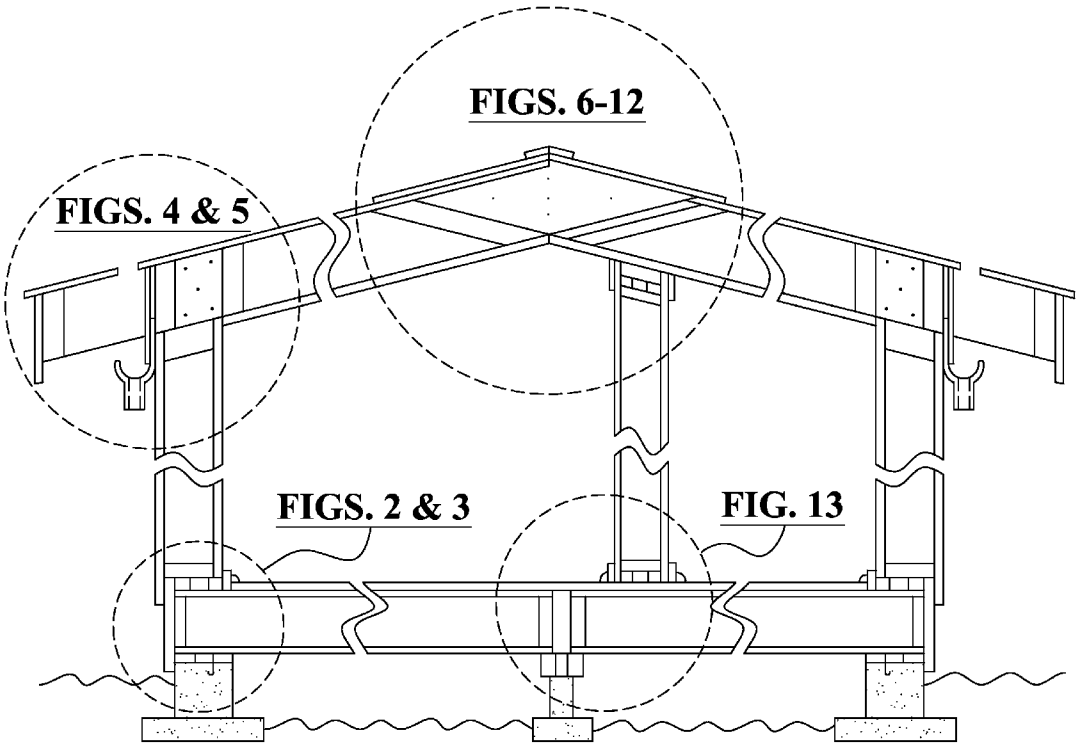
(52) **U.S. Cl.** **52/309.14**

(57) **ABSTRACT**

A house, (or other building) built using structural insulated panels (comprising a frame around a slab of polystyrene). Tempered glass covers the panels that are used in the roof and outside walls, and is also used for inside walls and partitions. Windows and skylights are holes in the polystyrene, but are covered by the same glass. Light emitting diodes or starlights are set between the glass covering and the polystyrene. The windows cannot be opened, but fresh air may be introduced by heat recovery ventilators or extra glass outside doors. Structural insulated panels used in forming floors are covered by oriented strand board.



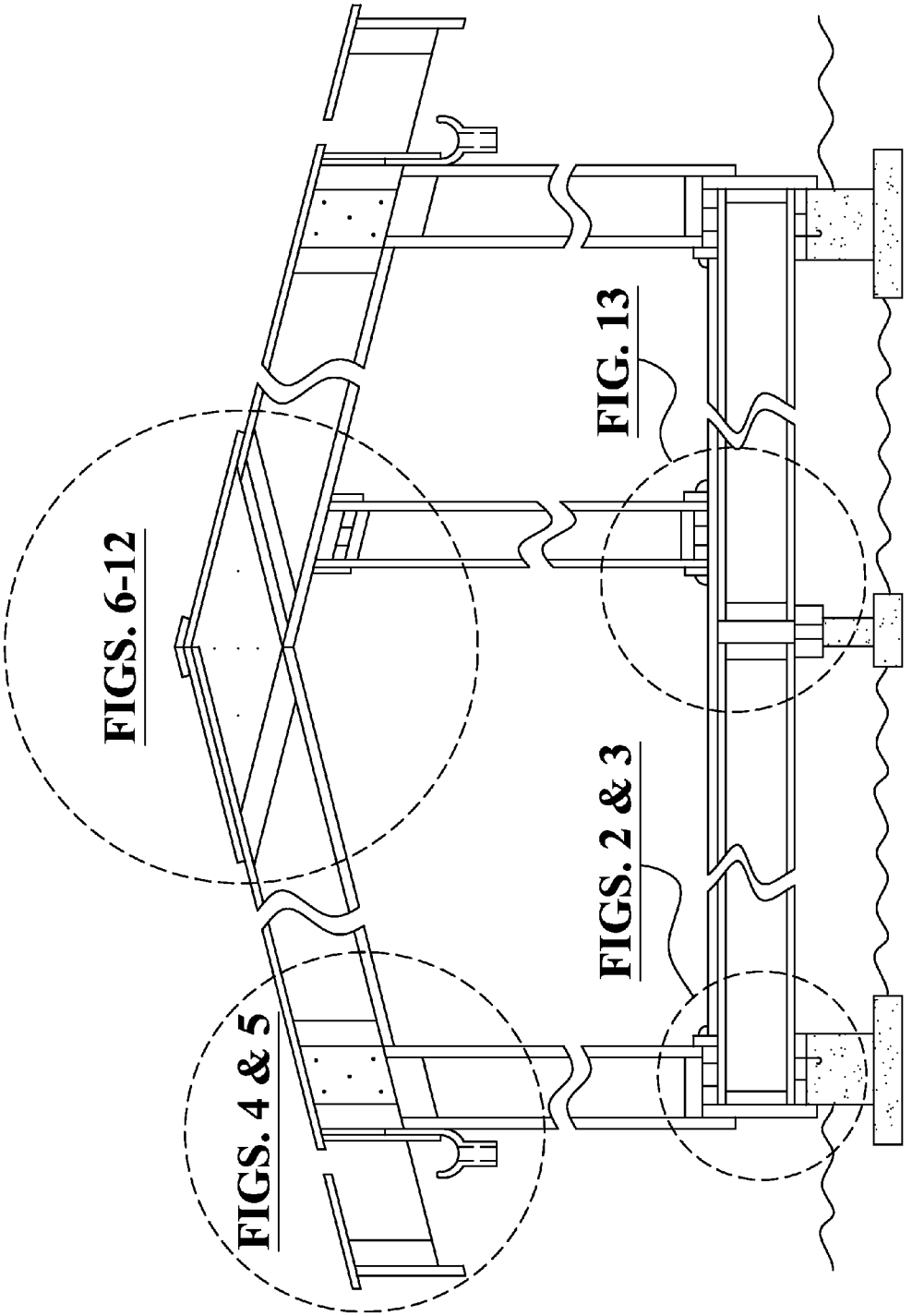


FIG. 1

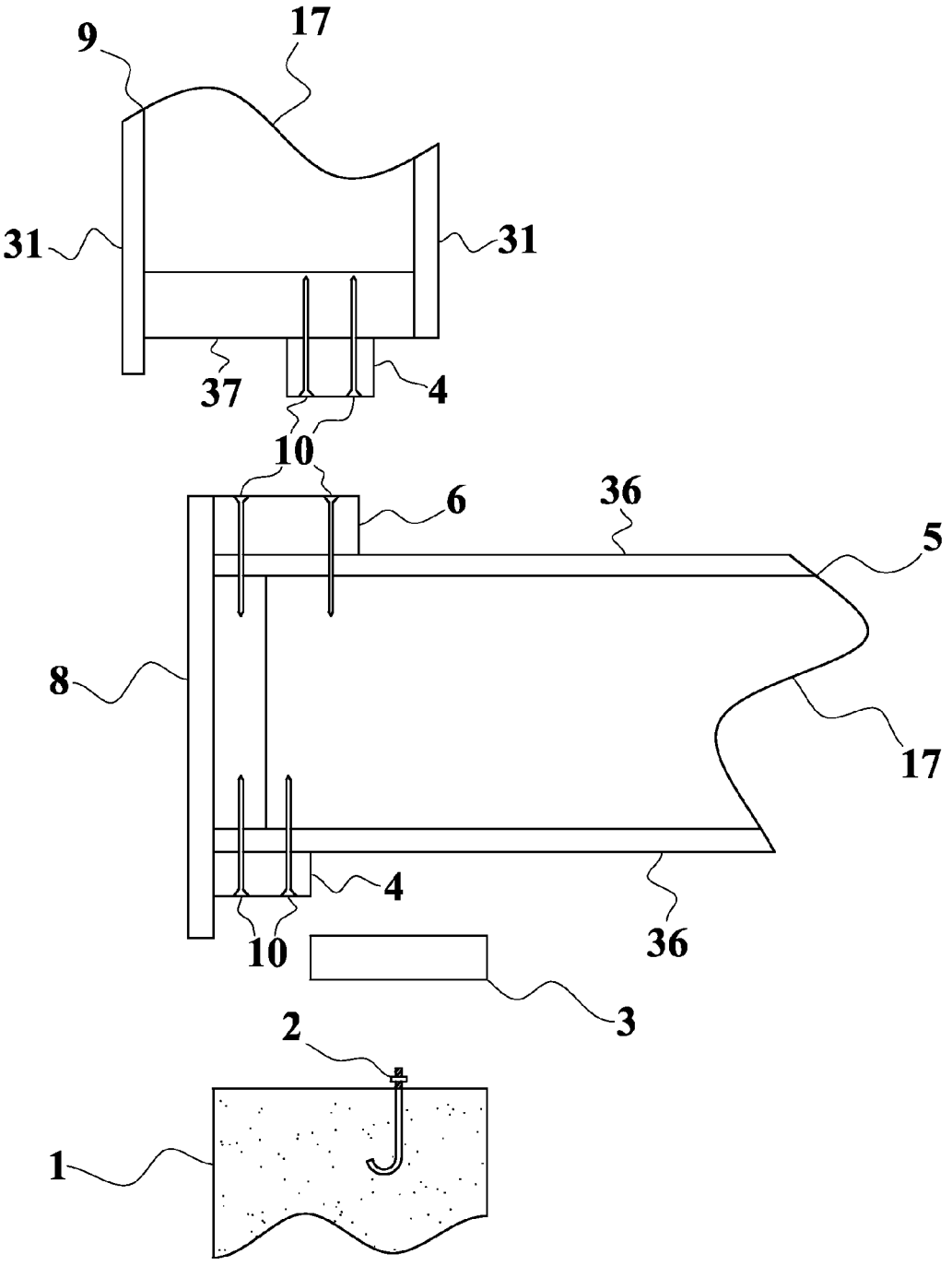
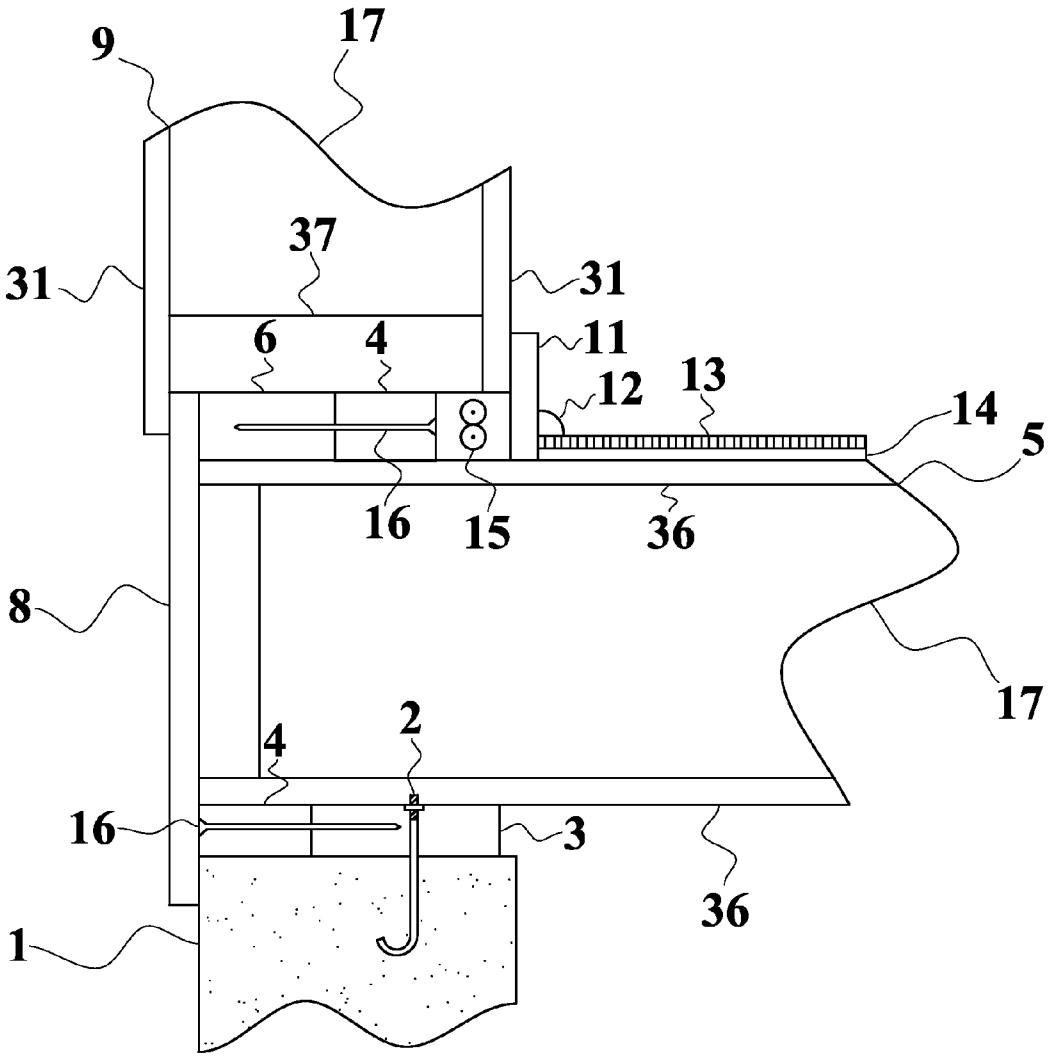


FIG. 2



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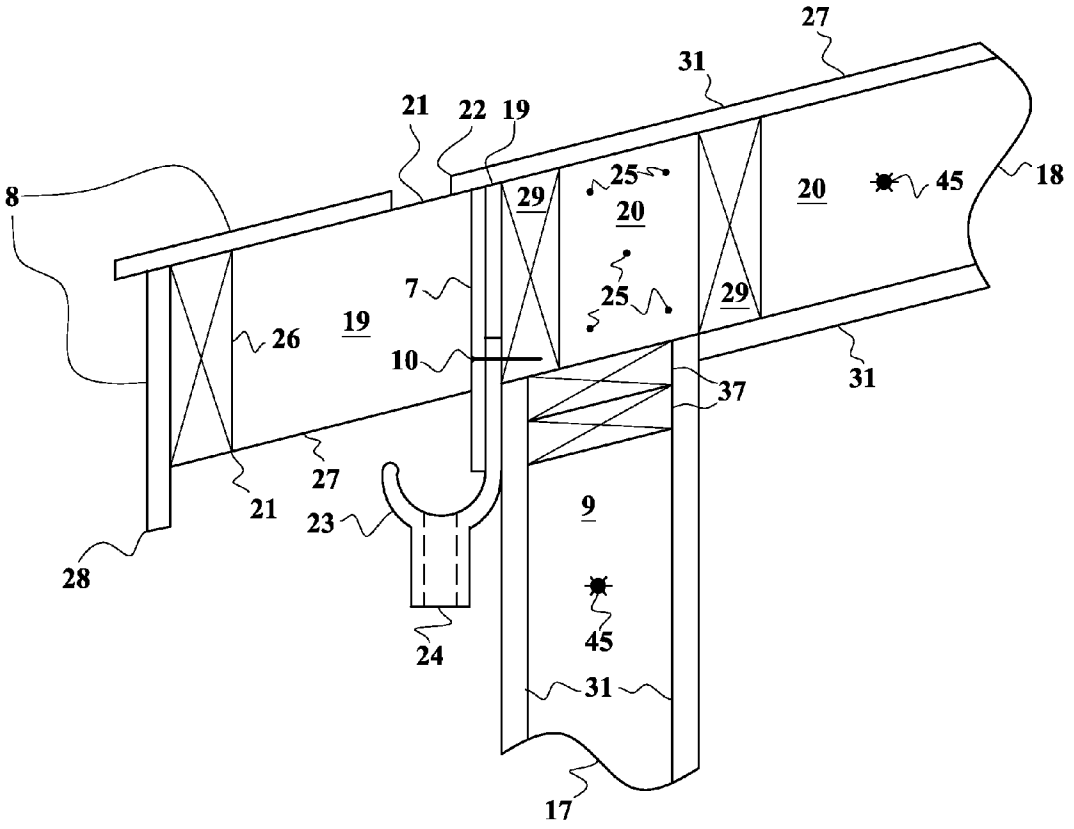
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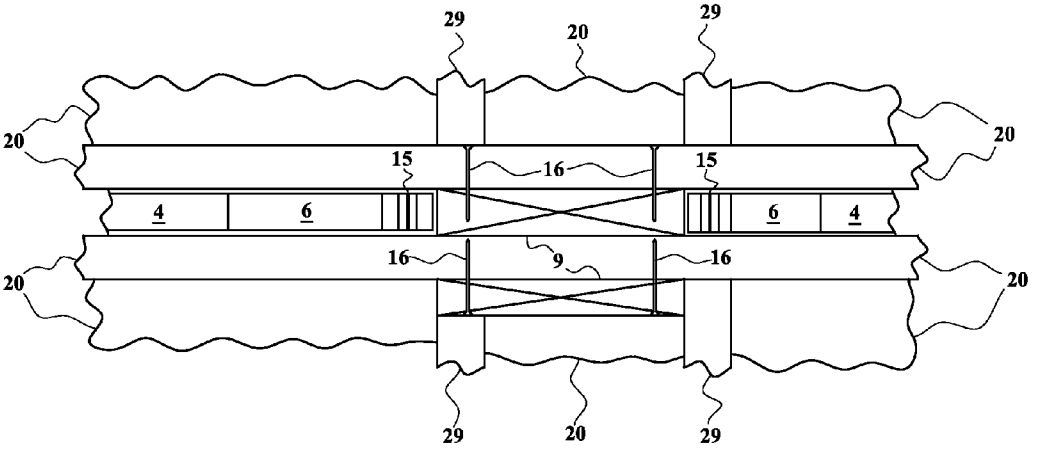
FIG. 4



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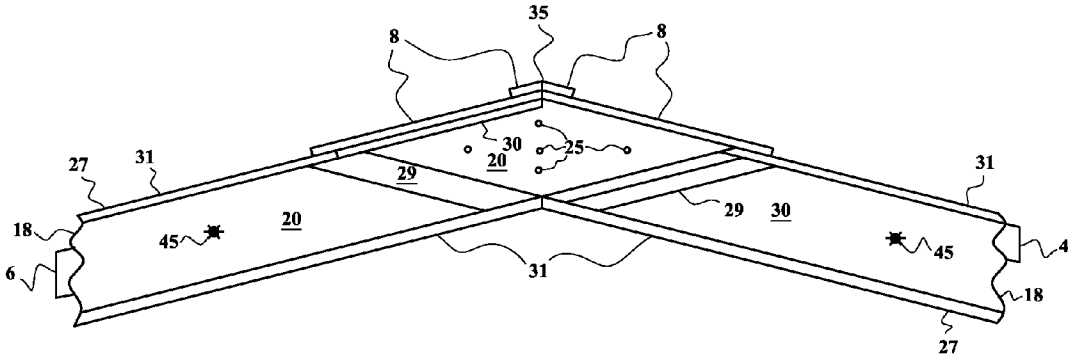


FIG. 6

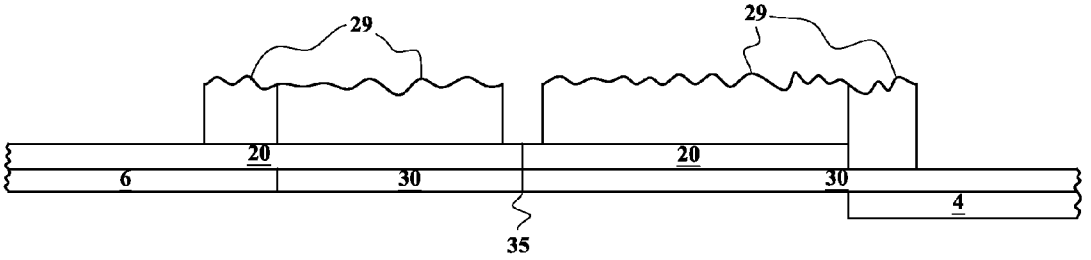
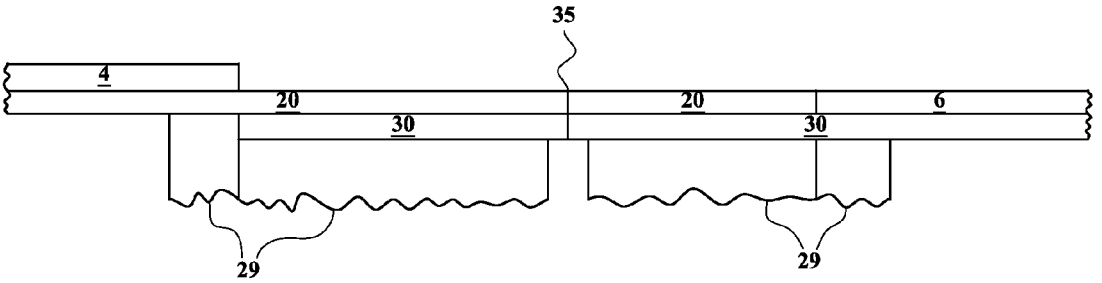


FIG. 7



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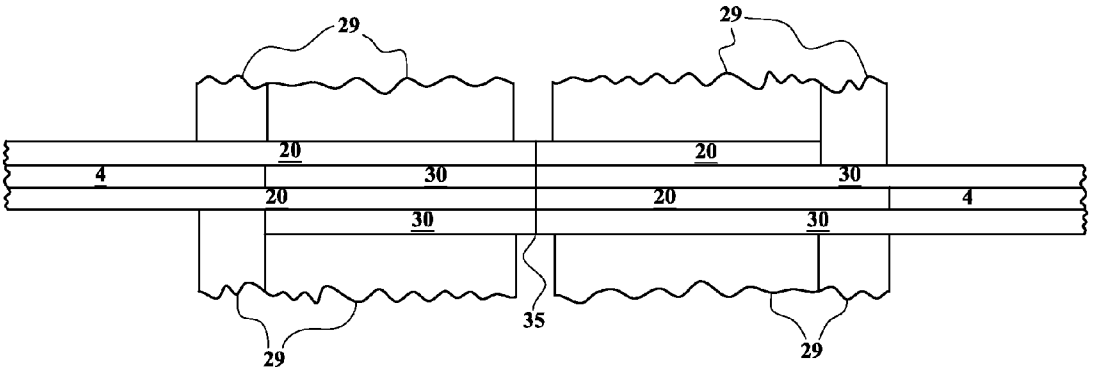

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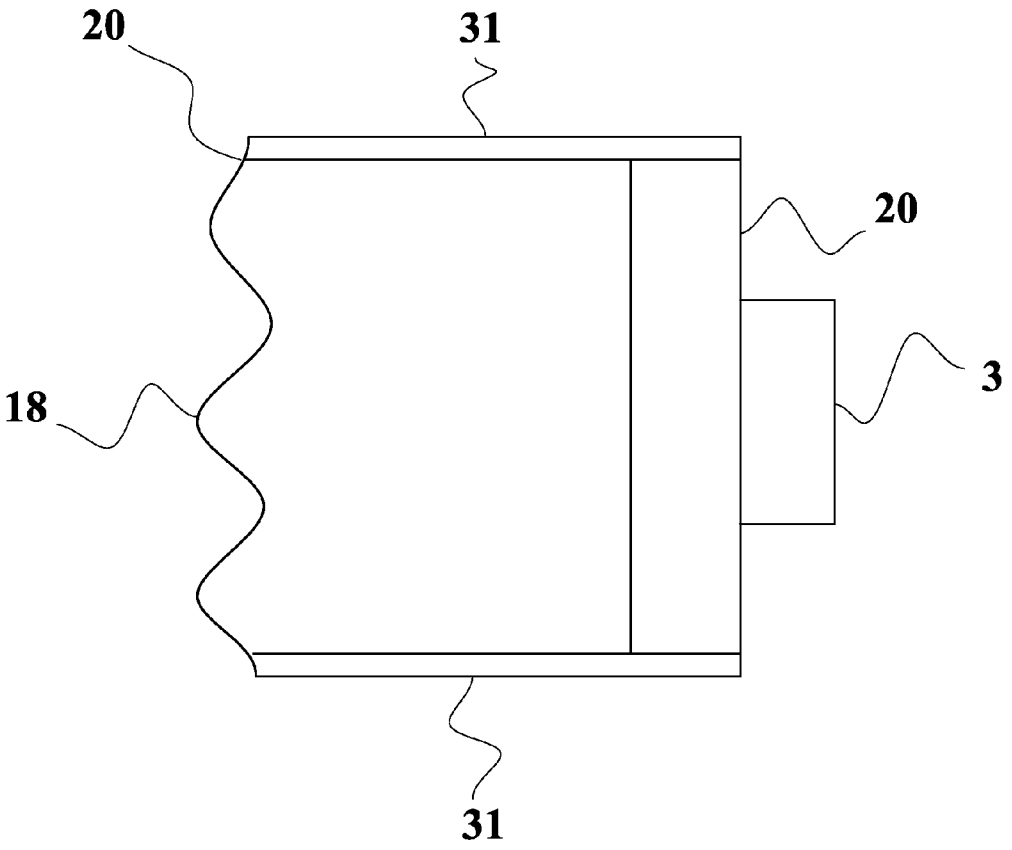
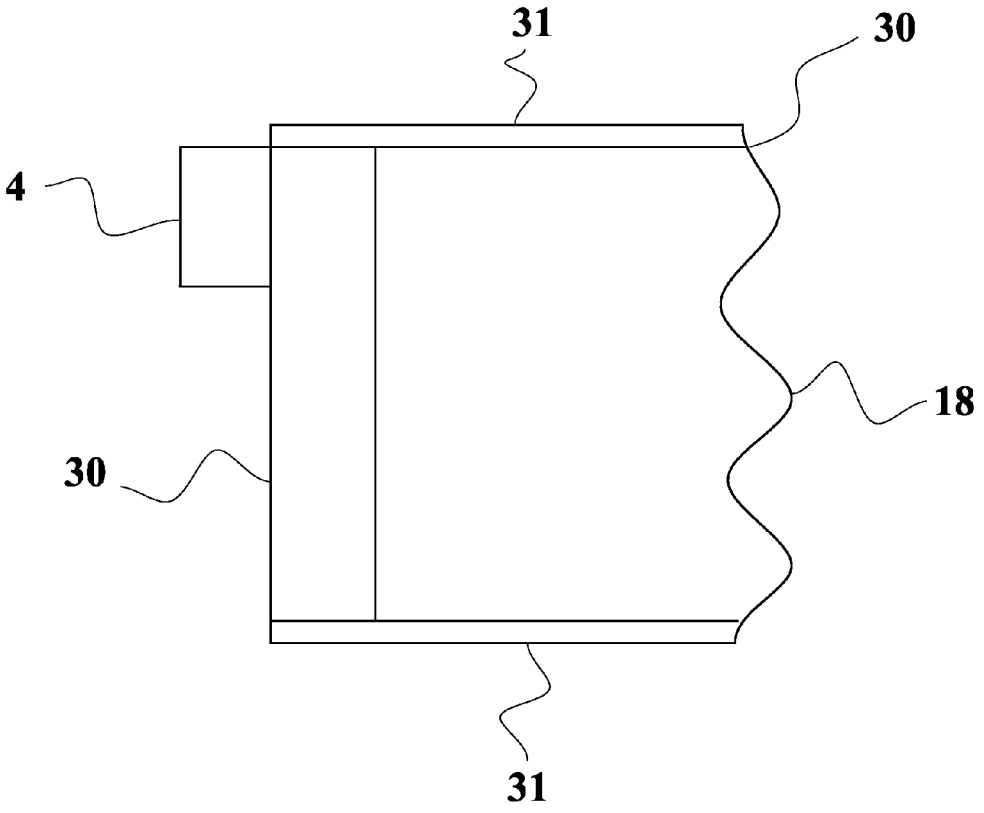


FIG. 10



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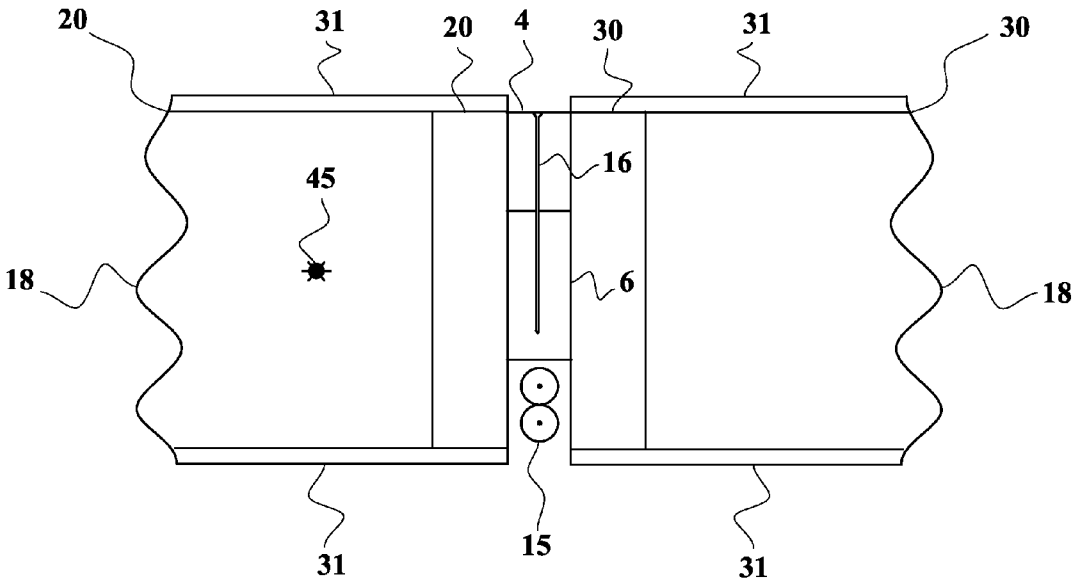

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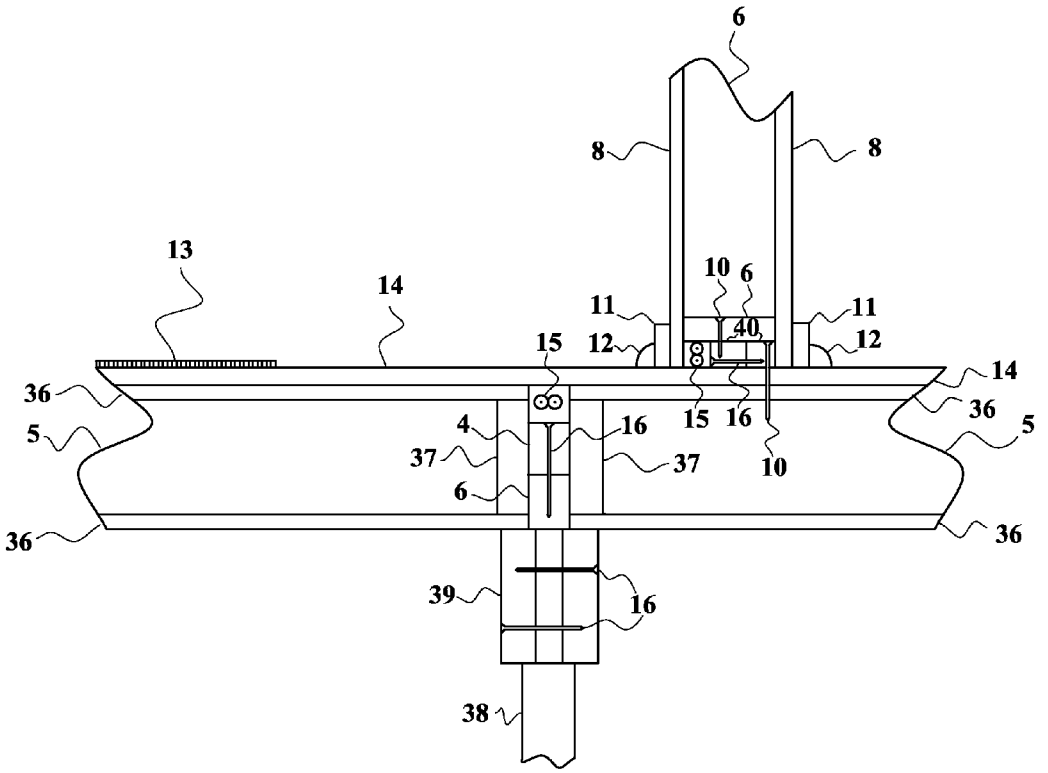
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FIG. 13

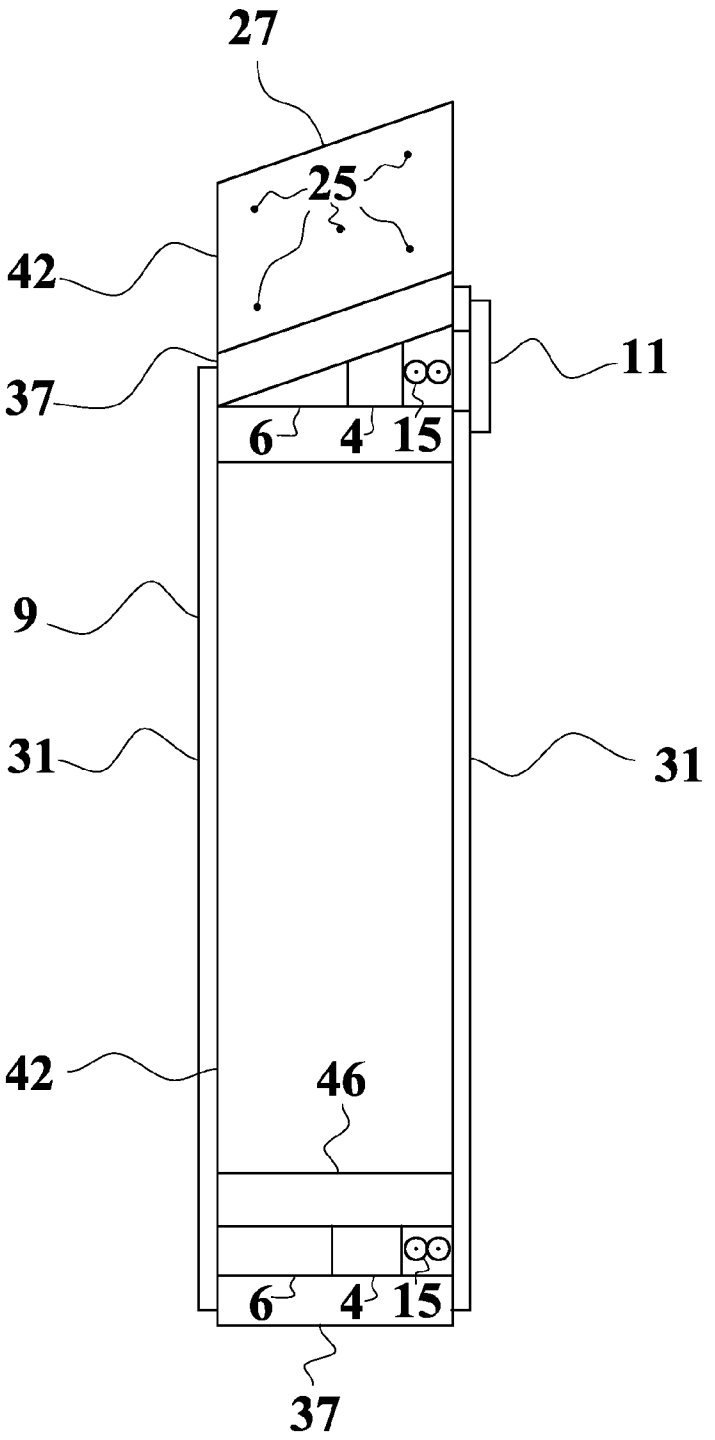


FIG. 14

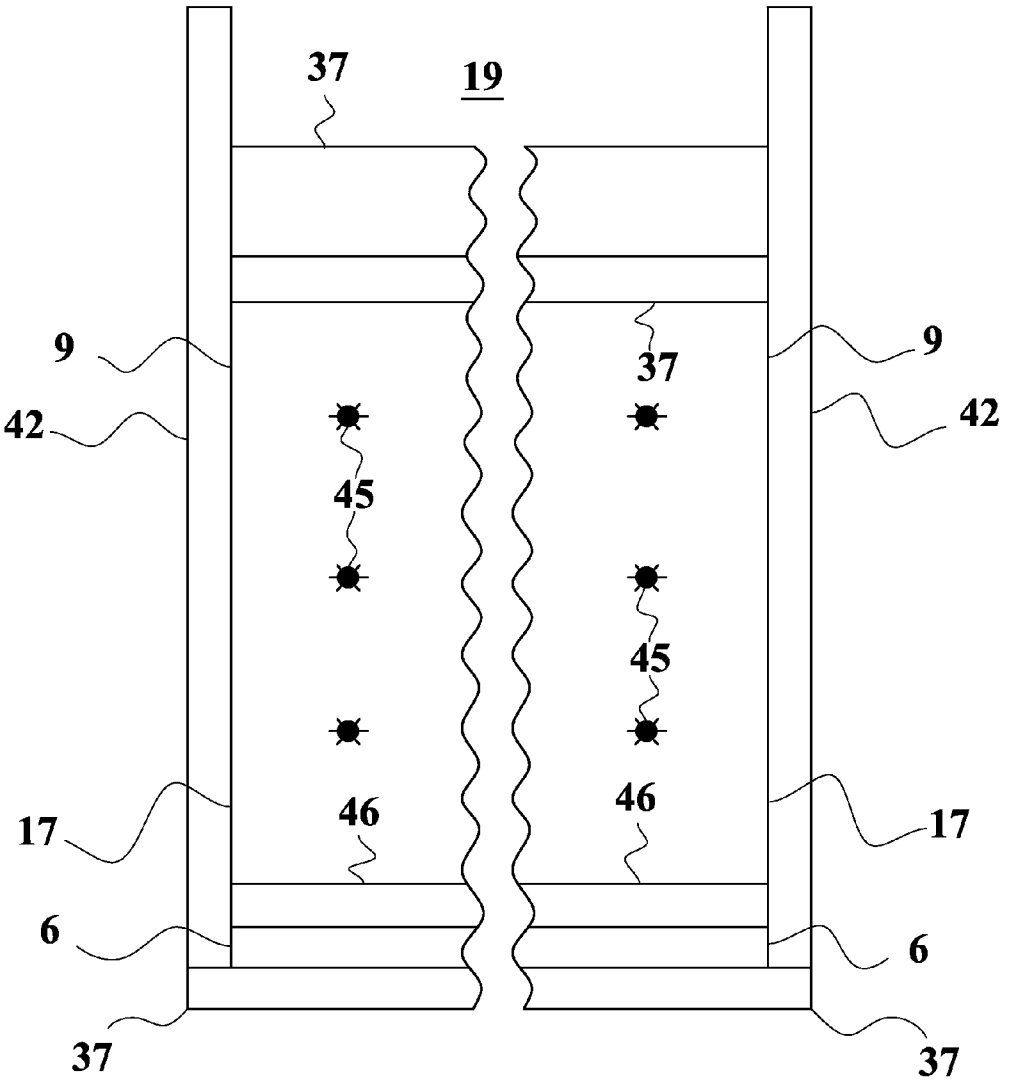


FIG. 15

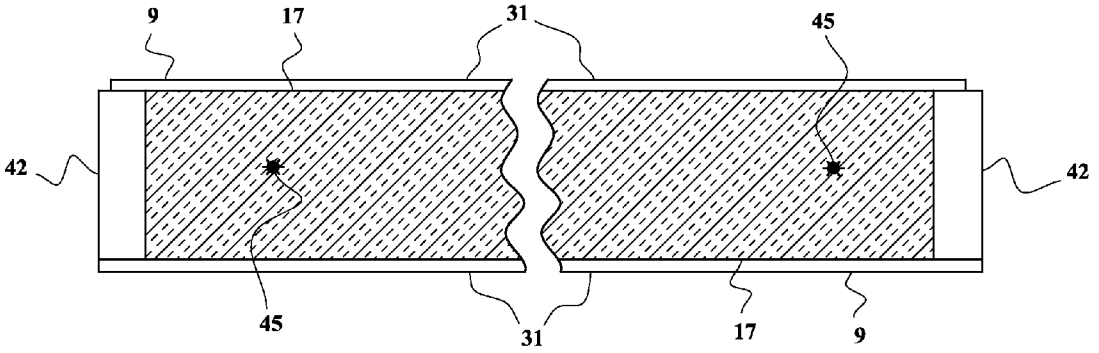
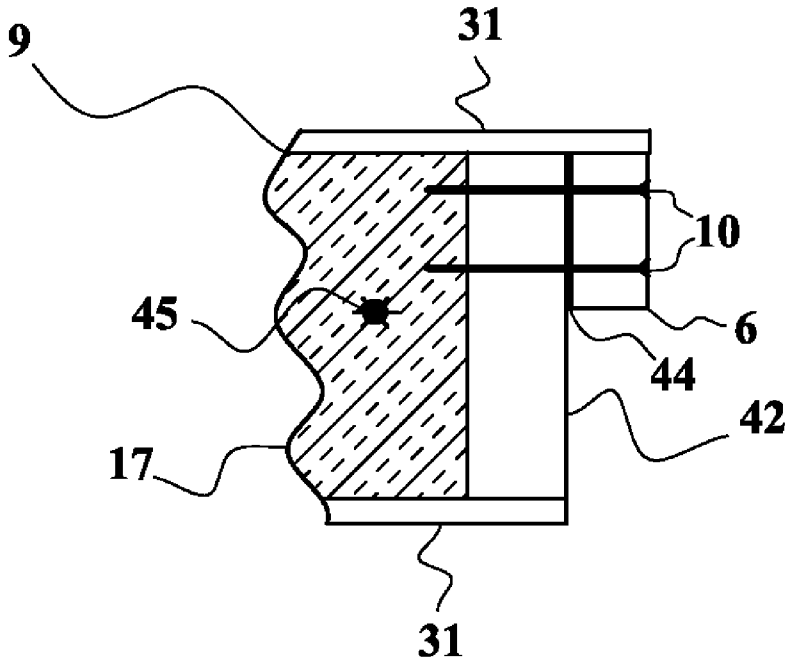


FIG. 16



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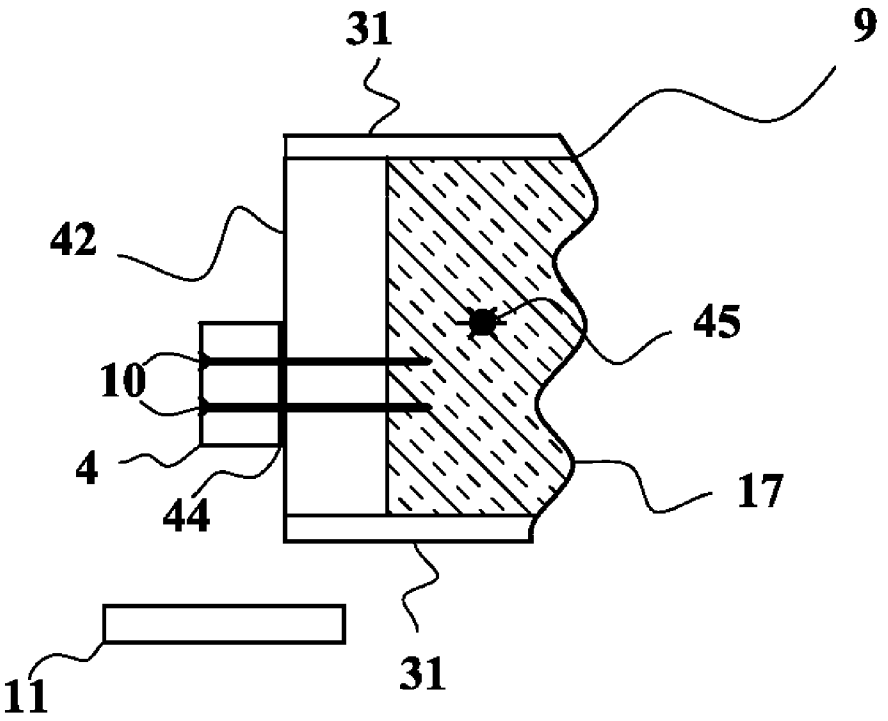
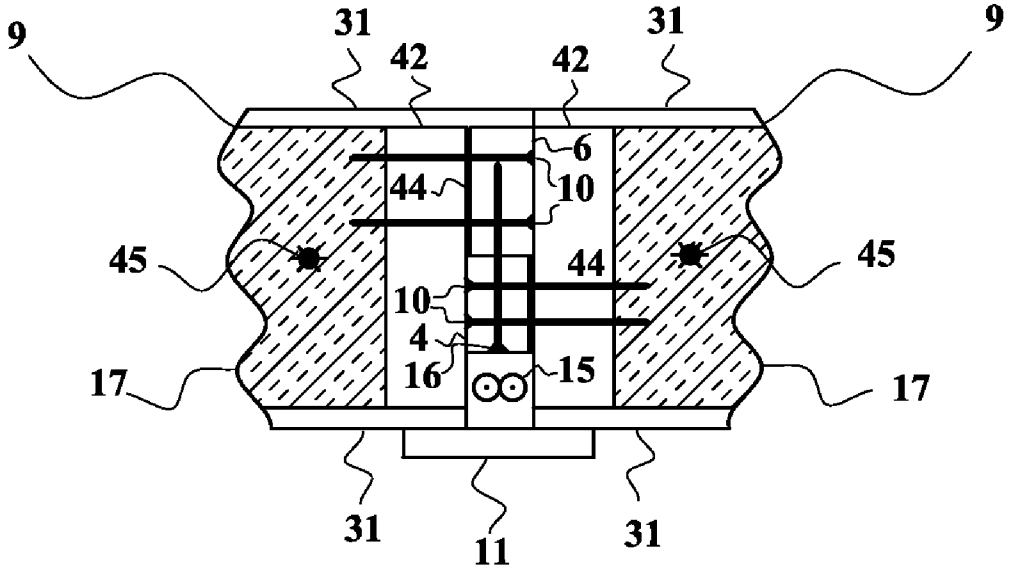


FIG. 18



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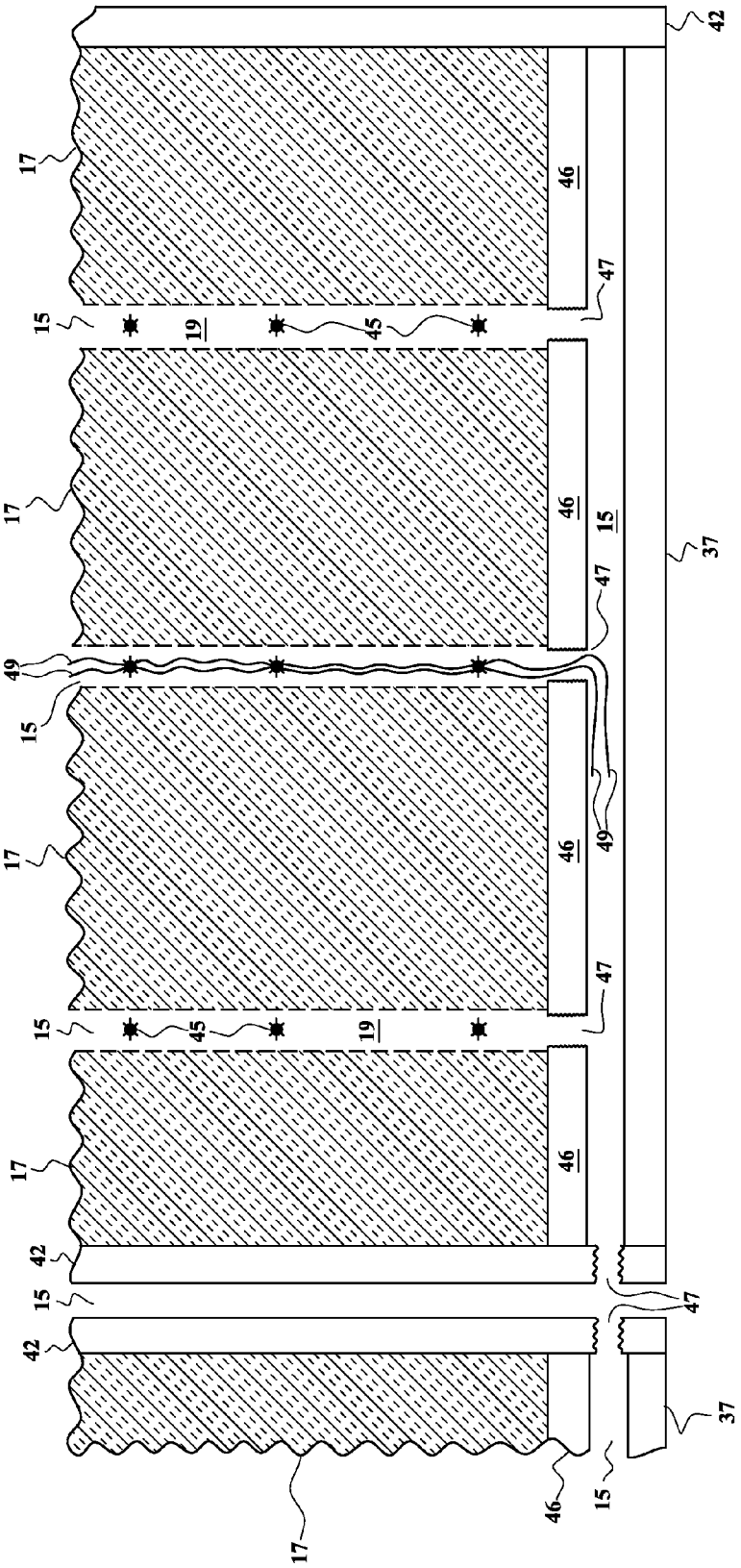

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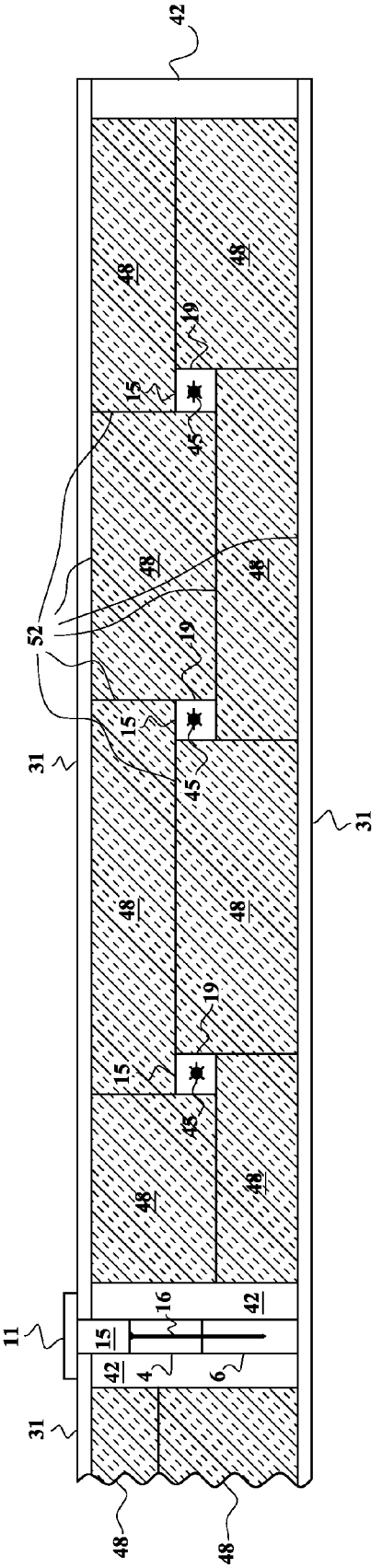

FIG. 21

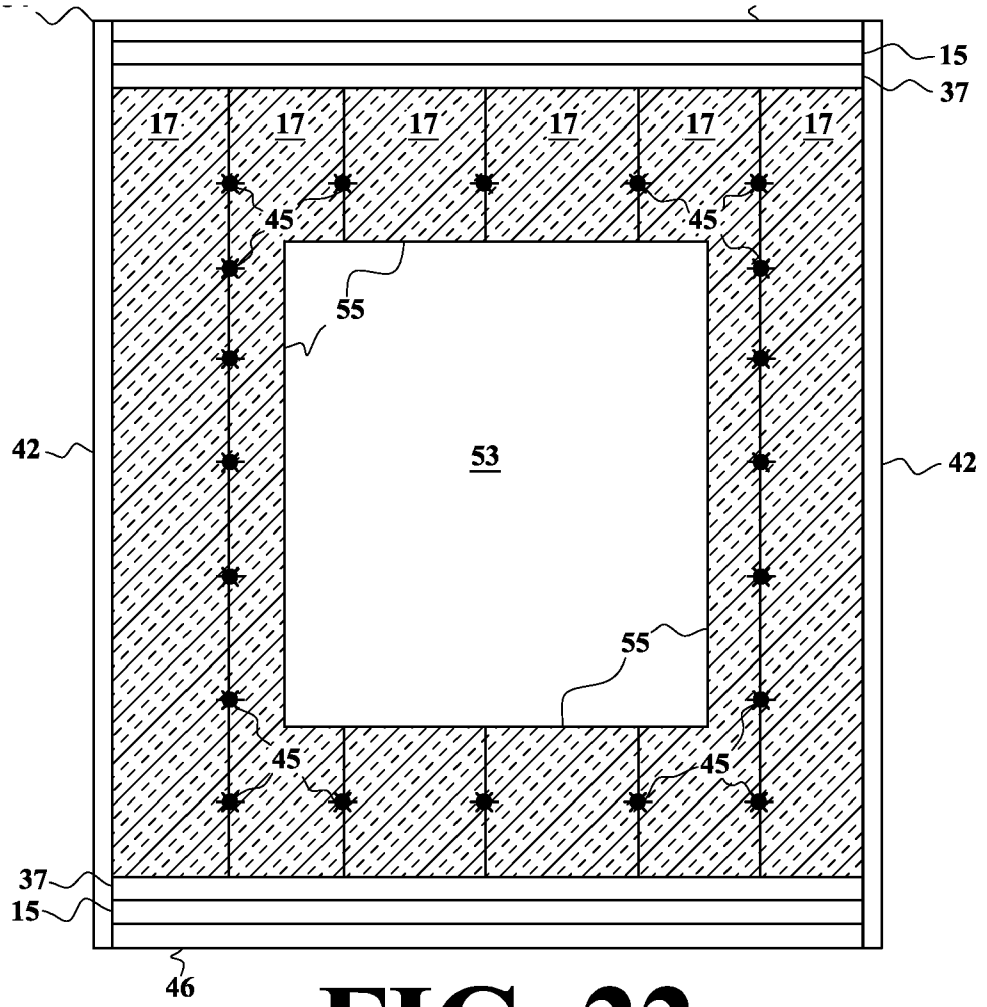

FIG. 22

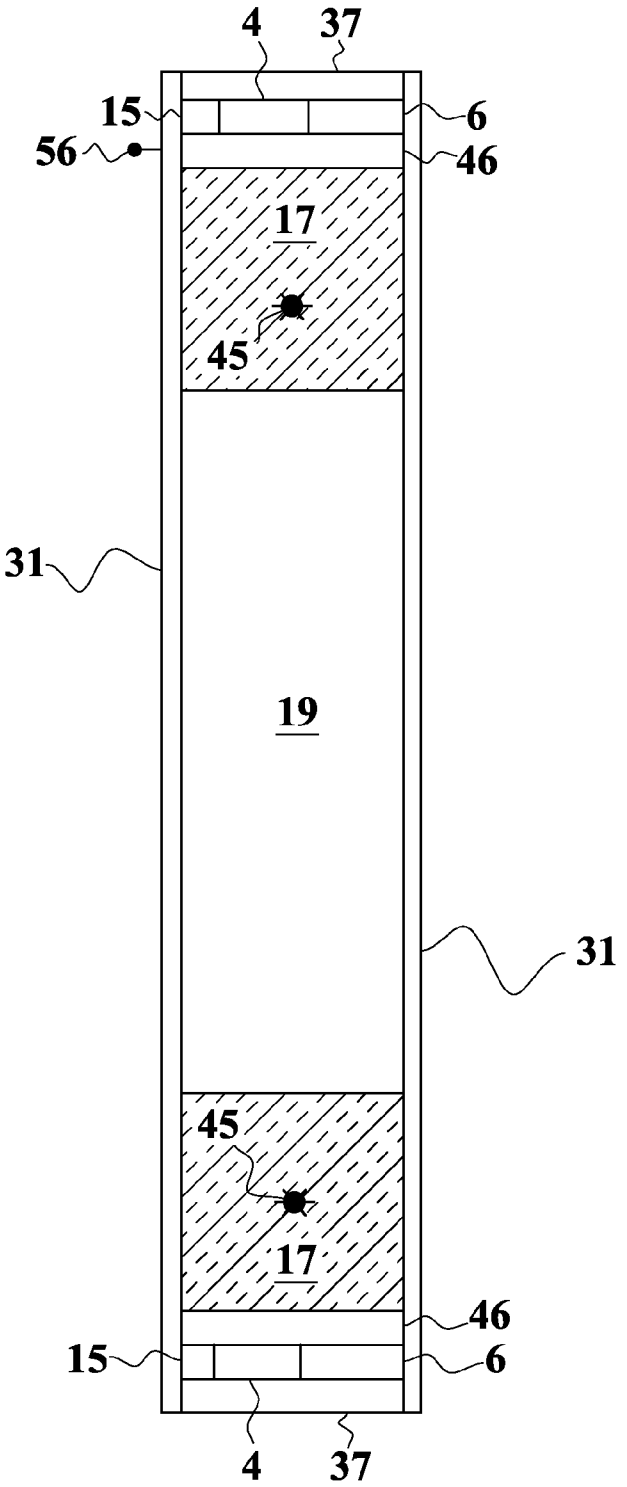

FIG. 23

PREFABRICATED GLASS HOUSE

CROSS REFERENCE TO RELATED APPLICATION

[0001] This application is based on and claims the benefit of Provisional Patent Application Ser. No. 61/283,046, filed Nov. 27, 2009, which is incorporated herein by reference.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates to prefabricated houses that are made primarily of glass and polystyrene.

[0004] 2. Description of the Prior Art

[0005] While there are previous inventions for prefabricated buildings and/or structures that are made of glass or polystyrene, there are none that are equivalent to the present invention.

[0006] U.S. Pat. No. 2,377,788, issued on Jun. 5, 1945, to Thomas Edward King, discloses a building constructed largely of glass, but without the use of polystyrene as in the instant invention.

[0007] U.S. Pat. No. 3,415,025, issued on Dec. 10, 1968, to Frank C. Walz, Jr., Stacey F. Pickup and Clyde A. Kratochvil, discloses a prefabricated building constructed largely of fiberglass, rather than the tempered glass and polystyrene of the instant invention.

[0008] U.S. Pat. No. 3,783,563, issued on Jan. 8, 1974, to Clyde Maurice Moore, discloses prefabricated building components formed of molded plastic material reinforced with glass fibers, rather than polystyrene covered by glass, as in the instant invention.

[0009] U.S. Pat. No. 3,785,913, issued on Jan. 15, 1974, to Lloyd C. Hallamore, discloses a prefabricated construction panel having a layer of rigid polystyrene (or other) plastic foam and a layer of fiber glass, rather than polystyrene slabs to which tempered glass is glued, as in the instant invention.

[0010] U.S. Pat. No. 4,167,838, issued on Sep. 18, 1979, to Darrell H. Metheny, discloses a portable building with panels covered by sheeting, which is preferably fiberglass, rather than the polystyrene panels covered by tempered glass, as in the instant invention.

[0011] U.S. Pat. No. 4,648,226, issued on Mar. 10, 1987, to Gerard Manon, discloses a glass building element, that can be used for constructing panels, walls, slabs and the like, but does not disclose polystyrene covered by glass, as in the instant invention.

[0012] U.S. Pat. No. 5,074,894, issued on Dec. 24, 1991, to Timothy P. Nelson, discloses an apparatus for isolating contagious respiratory hospital patients, which is a prefabricated room in combination with an air-flow control and filtering system. It is not an entire house, as is the instant invention.

[0013] U.S. Pat. No. 5,555,681, issued on Sep. 17, 1996, to Mark A. Cawthon, discloses a modular building system, including panels that "may be formed of any number of different transparent, translucent, and/or opaque sheet materials, either as non-woven sheets or as woven fabric materials." (Column 5, lines 8-10.) But the use of polystyrene panels covered by tempered glass, as in the instant invention, is not disclosed.

[0014] U.S. Pat. No. RE39,761, reissued on Aug. 7, 2007, to John Cahill, discloses a laminate wall structure, but does not disclose tempered glass covering polystyrene slabs, as in the instant invention.

[0015] U.S. Patent Application Publication No. 2008/0263968, published on Oct. 30, 2008, to Mark O. Day, discloses a prefabricated structure formed with panels that may have a polystyrene core layer between metal layers, rather than polystyrene covered by tempered glass, as in the instant invention.

[0016] U.S. Patent Application Publication No. 2009/0031621, published on Feb. 5, 2009, to Katsuyuki Kitagawa, discloses an all-weather farming house, made of pieced of foamed polystyrene, but not covered with tempered glass, as in the instant invention.

[0017] French Patent No. 2 561 281, published on Sep. 20, 1985, inventors Jean-Francois Roverato and Gabriel Roales, discloses plaster lined expanded polystyrene slabs for building external walls, reinforced with glass fabric on the exterior surface, rather than tempered glass, as in the instant invention.

[0018] None of the above inventions and patents, taken either singly or in combination, is seen to describe the instant invention as claimed.

SUMMARY OF THE INVENTION

[0019] The present invention is a prefabricated glass house (or other building) based on the use of Structural Insulated Panels (SIPs) which are stronger and more insulative than accepted conventional wood frame construction. SIPs are now covered with Oriented Strand Board (OSB) which has to be covered with roofing or siding outside and drywall inside. This new house has OSB floor SIPs but the wall and roof SIPs are covered with 3/16" tempered (crystal) glass. Glass serves as roofing, siding and inside wall and partition covering which does not need to, be painted or decorated and maintenance is an occasional wash. The 3/16" glass is referred to as "Crystal".

[0020] Most SIPs have a 2×6 frame around a 5½' thick slab of polystyrene. The present invention ("Crystal House") uses 2×8 frames for floors and wall SIP's and 2×10 frames for roof SIPs, so the Crystal House is substantially stronger and more insulative than house built using 6" thick SIPs with OSB facings. Where privacy is needed, such as partitions which do not have polystyrene filling, translucent opaque crystal glass is used. Window glass may also be turned opaque for privacy by the flick of a switch. Walls, roofs and partitions have enough Light Emitting Diodes (LEDs) or "Starlites" set between their glass coverings in the polystyrene to provide low cost "moonlite" intensity lighting. The whole house glows outside in the night. Windows and skylights are simply holes in the polystyrene. No window frame, hardware, sash, or trim and the labor to install them are required. They are similar to airplane windows which are non-openable and can be oval shaped. Fresh air can be introduced using heat recovery ventilators or extra glass outside doors that also serve as fire escapes and windows.

[0021] Accordingly, it is a principal object of the invention to provide a prefabricated house that is aesthetically pleasing.

[0022] It is another object of the invention to provide a prefabricated house that is economical.

[0023] It is a further object of the invention to provide a prefabricated house that can conserve energy.

[0024] Still another object of the invention is to provide a prefabricated house that can help the environment by using recyclable materials.

[0025] It is an object of the invention to provide improved elements and arrangements thereof in an apparatus for the purposes described which is inexpensive, dependable and fully effective in accomplishing its intended purposes.

[0026] These and other objects of the present invention will become readily apparent upon further review of the following specification and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027] FIG. **1** is diagrammatic overview of a one story house, with circles indicating parts of the house covered by FIGS. **2-3**, **4-5**, **6-12** and **13**.

[0028] FIG. **2** is an exploded view showing three segments of the junction between the concrete foundation, the SIP floor platform and a wall SIP section.

[0029] FIG. **3** is a sectional view showing the three segments in FIG. **2** assembled together: the foundation, the floor SIP section, and the wall SIP section.

[0030] FIG. **4** is a vertical sectional view showing the junction between a wall SIP section and a roof SIP section.

[0031] FIG. **5** is a horizontal sectional view of the junction between a wall SIP section and a roof SIP section.

[0032] FIG. **6** is a vertical sectional view of the junction of two roof SIP sections at the house ridge.

[0033] FIG. **7** is a top view of a first pair of roof SIP sections joined at the ridge.

[0034] FIG. **8** is a top view of a second pair of roof SIP sections at its ridge.

[0035] FIG. **9** is a top view showing the joined together assembly of the two pairs of roof SIP sections shown separately in FIGS. **7** and **8**.

[0036] FIG. **10** is a sectional view along line **32-32** in FIGS. **7** and **8** showing the 2×4 attaching plate **6** attached to the 2×10 rafter of the right side pair of SIP sections.

[0037] FIG. **11** is a sectional view along line **33-33** in FIGS. **7** and **8** showing the 2×3 attaching plate #4 attached to the 2×10 rafter of the left side pair of SIP sections.

[0038] FIG. **12** is a sectional view showing how the SIP sections shown in FIGS. **10** and **11** are joined together using a spike **16** at 12" centers.

[0039] FIG. **13** is a sectional view centered on the 6×10 foundation center beam of the house showing the junction of two floor SIP sections over the beam, and a typical 2×4 house partition over the SIP on the right side of the drawing.

[0040] FIG. **14** is a vertical sectional edge view of a house wall SIP section.

[0041] FIG. **15** is a vertical sectional face view of a house wall SIP section.

[0042] FIG. **16** is a horizontal cross section of a house wall SIP section.

[0043] FIG. **17** is a detail sectional view of the right edge of a house wall section onto which a connecting 2×4 has been attached.

[0044] FIG. **18** is a detail sectional view of the left edge of a house wall section onto which a connecting 2×3 has been attached.

[0045] FIG. **19** is a detail sectional of the junction of two wall sections which have been joined together by spiking (with 16) the 2×3 as shown in FIG. **18** to the 2×4 of FIG. **17**.

[0046] FIG. **20** is a vertical sectional view across the face of a wall section SIP showing the vertical 1½"×1¼" grooves, spaced **12**" apart, created by using polystyrene in slabs of three different thicknesses. These grooves are used to insert strings of low voltage LEDs ("Starlites") which are also spaced **12**" apart vertically.

[0047] FIG. **21** is a horizontal sectional view of a SIP wall section showing how the vertical 1½"×1¼" grooves are centered in the wall to set the LEDs ("Starlites") at an equal distance from each of the glass faces of the SIP wall section. The junction of the subject SIP or wall section to another SIP or wall section is shown on the left side of the drawing in both FIGS. **20** and **21**.

[0048] FIG. **22** is a vertical cross section across the face of a SIP wall section 5'4" wide, showing how a hole in the polystyrene SIP filling is left to create an area 36"×66" that can serve as a window in a glass house. No window frame, sash or trim is used to create the window.

[0049] FIG. **23** is a vertical cross section through a wall SIP section showing a space left in the polystyrene filling **66**" high that acts as a house window as described for FIG. **22**. Means for joining this wall SIP to a floor platform are shown on the bottom of the drawing and means for joining it to a roof SIP are shown at the top of the drawing.

[0050] Similar reference characters denote corresponding features consistently throughout the attached drawings.

LISTING OF REFERENCE NUMBERS

[0051] 1. 8" concrete foundation wall
2. "J" bolt and nut
3. 2×6 treated sill plate
4. 2×3 attaching plate
5. Floor SIP with 2×8 frame
   [0052] 7/16 OSB with 2×8 frame (**36**)
   [0053] Polystyrene interior slab (**17**)
6. 2×4 attaching plate
7. ⅜" plywood
8. Field applied 3/16" opaque translucent glass
9. Wall SIP 2×8 frame
   [0054] 3/16" glass on each side (**31**)
   [0055] Polystyrene interior (**17**)

10. Nails

[0056] 11. Joint cover plate
12. Quarter round mold
13. Carpet or other flooring
14. 7/16 OSB underlayment
15. Electric wiring and wiring chase
16. 4" attachment spikes or screws 12" on center
17. 7¼" thick polystyrene
18. 9¼" thick polystyrene
19. Void (no insulation)
20. Left roof SIP 2×10 frame
   [0057] 3/16" glass both sides (**31**)
   [0058] Polystyrene insulation (**18**)
21. 2×10 rafter exposed
22. 3/16" glass overhang for drip
23. Eaves troughing

24. Downspout

[0059] 25. Nailheads or screws tying SIPs together
26. 2×10 rafter fascia
27. Roof with 4/12 pitch
28. Eave overhung by 12"
29. 2×10 roof SIP cross beams
30. Right side roof SIP 2×10 frame
   [0060] 3/16" glass on each side (**31**)
   [0061] Polystyrene insulation (**18**)

31. 3/16" glass

35. Ridge

[0062] 36. 7/16" Oriented Strand Board (OSB)
37. 2×8 SIP cross beams
38. 6×6 foundation post
39. 6×10 built up beam (3-2×10)
40. 2×2 attaching plates
42. 2×8 stud
44. Glue line

45. Starlites (LEDs)

[0063] 46. 2×8 cross beam with 1¼" holes bored through for wires
47. 1¼" bored hole
48. Wall height or roof section height slabs of polystyrene
49. Low voltage wiring for LED Starlites
50. A 4' wide SIP section
52. Adhesive attaching polystyrene slabs together
[0064] and to wood framing and glass

53. Window 3'0"×5'3"

[0065] Two sheets 3/16" glass
[0066] Void between glass sheets
54. A 5'4" wide SIP section with a window opening
55. Edges of polystyrene at window opening
56. Curtain rods above windows

[0067] Note that the width of SIPs varies between 4', 5'4" and 8'. LED wiring channels are preferably spaced twelve inches apart. Any dimensions given in this specification are for the sake of illustration only, and do not limit the scope of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0068] The present invention is a glass dwelling house (or other building) which is almost 90 percent constructed of glass and polystyrene foam insulation. For marketing purposes, the new house will be called a "Crystal House". For extra strength, the glass is all 3/16" thick or "crystal" quality glass and tempered. Tempered glass is four times as strong as regular annealed glass.

[0069] For distribution purposes, the house will be referred to as a "Crystal" house rather than a glass house. Lindal Cedar Homes, Inc. will distribute this house as "Lindal Crystal Homes", also shortened as "LCH".

[0070] Many homes today are built using prefabricated sections called Structural Insulated Panels ("SIPs"). A typical wall SIP has a 2×6 frame around a 4'×9'×5½" slab of polystyrene foam. The frame has a 4'×9'×3/8" sheet of Oriented Strand Board ("OSB") on each side. The three elements are solidly glued together to form a 4'×9'×6" structural panel which is stronger and more insulative than a similar sized section of conventional wall. Similarly, a 4'×12'×6" SIP floor panel is stronger and more insulative than a 4×12 section of 2×8 conventional joists at 16" on center, and the insulation is covered on the underside.

[0071] For extra strength and maximum insulation, the Crystal House has a 2×8 frame around the floor and wall SIPs and a 2×10 frame around its roof SIPs. This provides a 7¼" thick slab of polystyrene with an insulative rating of R-30 plus for floors and walls, and 9¼" of polystyrene roof insulation rated at R-40 plus.

[0072] The main feature of the Crystal House is that the 3/8" OSB in the wall and roof SIPs is replaced with 3/16" Crystal glass which is tempered and is substantially stronger than 3/8" OSB. Also, Crystal glass is lower cost than the 3/8" OSB when the final cost of the house is considered. An OSB wall SIP needs to be covered with siding. Siding application labor and painting make outside wall finishing more expensive than Crystal glass. Crystal glass provides a stronger and more durable, harder finish that needs very little upkeep. However, OSB roof SIPs need to be covered with asphalt shingles outside and drywall inside which, including labor, makes the OSB roof SIP more expensive than 3/16" tempered glass covered SIPs. Similarly, OSB wall SIPs also need to be covered inside with drywall. The extra cost of drywall, its application labor and the labor to mud, tape and sand the drywall, plus decorating, makes an OSB SIP covering even more expensive than an SIP with Crystal glass covering.

[0073] Even partition sections covered with Crystal glass on both sides are lower cost than partitions covered with drywall on both sides. Also very important is the savings in construction time using glass covered SIPs rather than OSB covered SIPs. Six time-consuming tasks are avoided: roofing, siding, drywall application, mudding/taping/sanding, painting siding, and painting drywall. Overall construction time is reduced for many weeks, depending on house size. It is important to get extra time living in the house or the revenue from renting it sooner. Maintenance is a savings for the life of the house. Repainting inside and out is avoided. A hose down outside and a simple wash inside occasionally can be done by the homeowner.

[0074] Glass breakage is a false concern. People rarely throw stones at occupied houses. It is a felony! Recently, a Seattle couple was sentenced to twelve years in prison for throwing stones at cars on a freeway.

[0075] The entire surface of the glass, except over window openings, is glued to the surface of polystyrene slabs, giving the glass tremendous backup strength. Even if a sheet of glass is broken into many pieces, the glass will not fall, but will remain stuck to the polystyrene slab. Most windows are ordinary 1/8" annealed (double-diamond) glass, which is rarely quadrupled in strength by being tempered. Tempered 3/16" thick Crystal glass, backed up with a 7¼" slab of polystyrene, will cause most flying objects to bounce back. Windows with 3/16" Crystal tempered glass will suffer less breakage than ordinary untempered 1/8" thick glazed windows. Yes, glass is brittle, but there should be less worry about breaking glass in a Crystal Home than with a conventional home. If a sheet of glass does get cracked, it can be simply replaced by using heat to melt glue (that is a silicone mixture) to unstick the cover strips and the broken glass pieces.

[0076] Windows for Crystal Homes are very simple and cost nothing. If you need a 4'×3' kitchen window, you simply leave a 4'×3' hole in the polystyrene in a 5'4" wide SIP panel about 3'6" from its bottom. The cost of the window is negative because you save twelve square feet of 7¼" thick polystyrene and you save the cost of sash, window frames, inside trim, hardware and the labor to install them. Though two sheets of 3/16" glass 7¼" apart will provide adequate insulation SIPs, with windows in them they can be made with one or two thermal glass coverings, providing superior insulation. In any case, you get a free permanent air-tight storm window. Or one glass face can be the special type of glass that can, with the flick of an electric switch, be turned opaque for privacy. Crystal House windows are like airplane windows in that they

cannot be opened. They can be oval or any other unusual shape. Windows carelessly left open waste millions of dollars in energy nationwide every day. Fresh air can best be provided by using Heat Recovery Ventilators ("HRV"), which can be controlled by timing devices to limit their operation and avoid wasting energy. Also, extra doors can be used for ventilation and as fire escapes, and also serve as extra windows. Of course, window screens are not needed. Glass in window areas would be clear and cleaned, but for privacy most partition glass should be opaque. The glass covering the walls and roofs on both sides can be low cost flawed glass or straight float ungraded production glass.

[0077] The Crystal House has the capacity to provide basic low cost Light Emitting Diode (LED) lighting. LEDs are set in 1½"×1¼" channels in the center of the wall and roof SIPs. The channels are spaced one foot apart and the LEDs in the channels are also spaced on foot apart. Partition LEDs where there is no polystyrene are similarly spaced. Brightness is set at "moonlight" intensity so that occupants can see their way around at night. Light fixtures and table and floor lamps will provide extra lighting as desired. If the light bulbs in these lamps and fixtures are also LEDs, there will be more energy savings. With the LEDs set in the middle of the outside wall and roof polystyrene panels, the Crystal House will glow outside in the night with a very pleasant appearance, especially during holiday seasons. This LED lighting will be marketed as "Starlites" and the low intensity lighting will be marketed as "Moonlite". Many of the Starlites can be fixed with on and off circuit interrupters that will give the Starlites sparkle.

[0078] The inside and outside doors for the Crystal House are similar to slab plywood doors. 3/16" tempered Crystal glass is used instead of plywood. This makes the core for a 1⅜" inside door 1" thick and a 1¾" outside door 1⅜" thick. In most applications, the door glass would be opaque for privacy, however, outside doors designed for fresh air and fire escape could be clear glass to act also as windows.

[0079] Important to this invention is the Crystal House jointing system. Glass panels, unlike OSB SIPs, cannot be easily spiked together or to post and beam framing. Each wall and roof SIP section has strips of wood around its perimeter. In the case of 2×8 SIP frames, there is a 2×4 (1½"×3½") on the top edge and one side edge and a 2×3 on the bottom and the other side. The 2×3s and 2×4s are fixed with their broader side to the broad side of the 2×8. The 2×4s are on one edge of the 2×8 frame and the 2×3s are near the middle of the 2×8 and are set so that they are tight to the 2×4s when two sections are set firmly together.

[0080] This leaves a 1¼"×1½" groove around each SIP or section. This channel is used to conduct electric wires for 110 volt power and low voltage direct current for LEDs all over the house and many of the vertical channels have light switches set in them at shoulder height and receptacles at knee height. These channels have cover strips that can be removed to service wiring. Sections are firmly fastened together on all sides by nailing the edge of the 2×3s of one section to the edge of the 2×4s of the next section, using 4" spikes at 12" centers. Screws can be used instead of spikes, making whole sections removable. For the 2×10 perimeter of roof sections and for foundation sill plates, 2×6s are used instead of 2×4s. In partitions, the 2×4s and 2×3s are replaced with 1½"×1¼" strips, leaving a 1"×1½" space for wiring. For instance, a firm joint between two wail sections is made by setting the sections together so that the edge of the 2×3 one section is set tightly to the edge of the 2×4 of the other section, then 4" spikes at 12" centers are nailed through the 2×3 edgewise and 1½" into the 2×4, effecting a solid joint.

[0081] Besides being joined together at their edges, the SIP sections have their side framing members (2×8s for floors and walls and 2×10s for the roof) extended to overlap adjacent sections and similar extensions adjoining their ends. Wall SIP extensions are fastened with spikes to 2×10 roof SIP extensions and roof and floor SIPs are spliced together over beams using their extensions. The whole house is locked together with all the Crystal SIPs being solidly fastened together on their sides and ends.

[0082] The best way to produce and build the present invention is to prefabricate the home in a shop that is equipped to handle large glass sheets. The shop should also be set up like a factory that produces Structural Insulated Panels ("SIPs"). In fact, the house prefab panels are all SIPs except the partition panels that do not have polystyrene cores. Most SIPs have 2×6 wood surrounds. To get extra strength and extra insulation, the floor and wall panels for this home are SIPs with 2×8 surrounds, and to get even more insulation in the roofs, the roof SIPs have 2×10 surrounds.

[0083] Another difference in the SIP surrounds in this new house is that most of the SIPs have sides that extend beyond the insulated area on one end and often both ends. These extensions allow jointing between section ends and other sections, such as the junction between the wall and roof sections. (See FIGS. **4** and **5**.) Or the sections can be joined end to end with overlapping extensions firmly bolted or attached together with screws for easy takedown if repairs are necessary. (See FIGS. **6-12** which show the way the ridge sections are connected). This leaves the eave area and the ridge area uninsulated (to be insulated in the field).

[0084] Besides being thicker, the subject floor sections or SIPs have side extensions that overlap over the main central house beam, but do have 7/16" thick Oriented Strand Board (OSB) faces. Ordinary SIPs have 3/8" thick OSB, but at this date, 7/16" OSB is lower cost than 3/8" OSB because of current greater volume production of 7/16" board.

[0085] The main feature of this invention is that the wall SIPs, roof SIPs and the partition sections are covered both sides with glass instead of OSB. 1/8" thick (Double. Diamond) glass matches the strength of 3/8" OSB in sheer tests, but tempered 3/16" Crystal glass is used for extra strength construction wise, and better resistance to possible abuse during construction and over the long term. Tempering quadruples the strength of glass.

[0086] Ordinary OSB covered SIPS can be spiked together and even face nailed to post and beam house framing. Crystal House glazed SIPs need side joining and good end joining for maximum sheer strength.

[0087] Windows and skylights are simply holes left in the Styrofoam wall and roof SIPs. They can be any shape or size desired, and they are unopenable and absolutely air tight, like airplane windows. The outside glass is like a storm window. The glass inside and outside can be twin pane thermals, making a superior insulated window. Also, one pane could be the special type of glass that can turn opaque for privacy at the flick of a switch. Glass covering window areas must be clear and thoroughly cleaned before enclosing. All the rest of the glass can have faults and can be run of the pour glass, not graded, substantially lowering the cost of the home. Sand is cheap enough, but runs of the pit sand are cheaper than selected sand. Screens are not needed for windows.

[0088] Outside doors have frames, trim and hardware, however they are similar to plywood doors with crystal 3/16" tempered glass faces instead of plywood. The glass can be opaque for privacy or clear for doors that provide ventilation and are designed for fire escape, serving otherwise as openable windows.

[0089] Ventilation is also provided by the use of Heat Recovery Ventilators ("HRVs") which, if desired, can be time controlled to save energy. Inside doors are also crystal glass, covered to avoid maintenance costs, that can be opaque glass for privacy, but can be clear glass if desired. Holes in the polystyrene windows do not need window frames, sash, trim and hardware, but can have curtain rods (**56** in FIG. **23**) set in the top of the wall. 1½"×1¼" channels can also provide means to hang pictures.

[0090] Some lighting is provided using low cost to operate Light Emitting Diodes ("LEDs"), which are set at 12"×12" spacing in outside walls, partitions and roof areas. This is accomplished in 7¼" polystyrene walls by building the 7¼" space up with section slabs 15"×3" and 9"×4½" in length (**48** in FIG. **21**). These pairs of slabs are glued together in capital letter T ("tee") shaped configurations with the 15" slab being the top of the tee and the 9" wide slab being the base of the tee. These combination tees are spread across a section alternatively up and down, leaving a section high channel 1¼"×1½" (**15** in FIG. **21**) in which LEDs and their low voltage wiring are set. The wiring feeds down to a 2×8 plate (**46** in FIG. **20**) which has 1¼" holes bored in it (**47**) 12" apart that feed the wires into a cross channel (**15**) and into the wiring system for the home. The slabs at the edge of a SIP are cut shorter in width. The 2×3s (**4** in FIG. **23**) are chopped up into 10½" lengths to provide 1½" channels between them to bring the wires (**49** in FIG. **20**) to the main cross channels (**15**). The LEDs are controlled for brightness by a rheostat switch. The light is referred to in publicity as "starlite" in "moonlite" intensity. Light brightness is set so that one can see around the house at night, yet not keep a person awake in a bedroom. Areas can be individually controlled and circuit interrupting devices can shut the power on and off to give a twinkle to the starlites. The main lighting will come from light fixtures, floor and table lamps. As the LEDs are in the middle of the polystyrene wall filling, they will also shine outside, and the whole house will glow in the night. Roof slabs are 15"×4" and 9"×5½". The small slabs (**48** in FIG. **21**) are glued together and to the glass and surround frames, making solid one-piece SIPs.

[0091] It is to be understood that the present invention is not limited to the sole embodiment described above, but encompasses any and all embodiments within the scope of the following claims.

I claim:

1. A building comprising:

polystyrene slabs; and

tempered glass covering some of the polystyrene slabs.

2. The building according to claim **1**, wherein the building is a prefabricated house.

3. The building according to claim **2**, wherein the polystyrene slabs are surrounded by frames to form structural insulated panels.

4. The building according to claim **3**, wherein structural insulated panels used in walls and roofs have tempered glass faces.

5. The building according to claim **4**, wherein structural insulated panels used in floors have orientated strand board faces.

6. The building according to claim **5**, further comprising:

partition sections that do riot contain polystyrene, but have tempered glass faces.

7. The building according to claim **6**, wherein the partition sections are constructed using studs and plates, and are not insulated.

8. The building according to claim **7**, wherein the frames of the structural insulated panels and the partition sections have side framing members extended to overlap the sides of adjacent frames of structural insulated panels and partition sections.

9. The building according to claim **8**, wherein the side framing members are extended by scantlings, with the scantlings of adjacent framing members fitting together and being fastened by attachment members, while leaving channels for electrical wiring.

10. The building according to claim **9**, wherein the channels for electrical wiring are covered by tempered glass cover strips, with holes for attachment members.

11. The building according to claim **1**, wherein some of the polystyrene slabs are of a greater length and some are of a lesser length, and polystyrene slabs of the greater length are joined to polystyrene slabs of the lesser length to form shapes resembling the capital letter T, with slabs of the greater length forming the tops of the tees, and slabs of the lesser length forming the bases of the tees.

12. The building according to claim **11**, wherein some of the tees are placed right-side-up and others are placed upside-down, with the right-side-up tees alternating and being adjacent to the upside-down tees.

13. The building according to claim **12**, wherein electrical wiring for light emitting diodes passes through gaps between the tees and through holes bored in the bases of the tees.

14. The building according to claim **13**, wherein each pair of polystyrene slabs joined to form a tee is surrounded by a single frame to formed a single T-shaped structural insulated panel.

15. The building according to claim **14**, wherein the T-shaped structural insulated panels have tempered glass facing.

16. The building according to claim **4**, wherein holes are cut in the polystyrene slabs to form windows in some of the structural insulated panels used in walls and roofs.

17. The building according to claim **16**, wherein the structural insulated panels used in walls and roofs have the tempered glass facing on each of two opposite sides.

18. The building according to claim **17**, wherein the tempered glass facing on at least one side of at least one of the structural insulated panels is double pane thermal glass.

19. The building according to claim **18**, wherein one of the panes of the double pane thermal glass can be turned opaque by moving an electric power switch.

20. The building according to claim **4**, wherein doors are formed from structural insulated panels having tempered glass faces on both sides, with frames that can accommodate door latches.

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