July 2, 1946. J. C. HUBER, JR 2,403,369

GLASS BUILDING CONSTRUCTION

Filed June 21, 1943 2 Sheets-Sheet 1

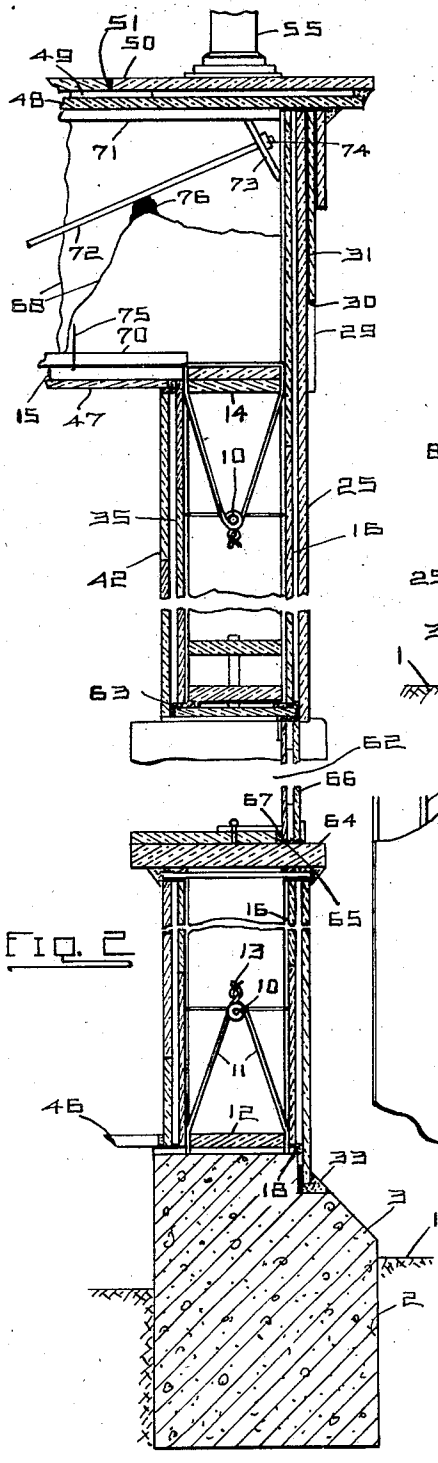


FIG. 2

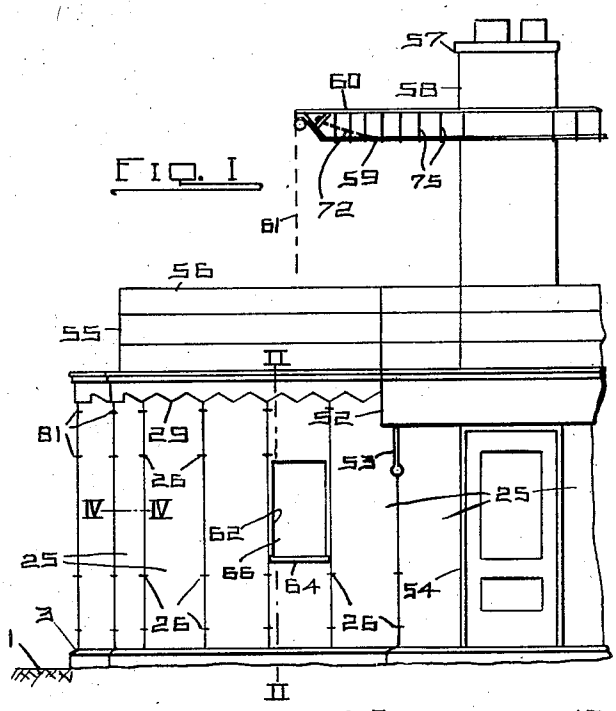


FIG. 1

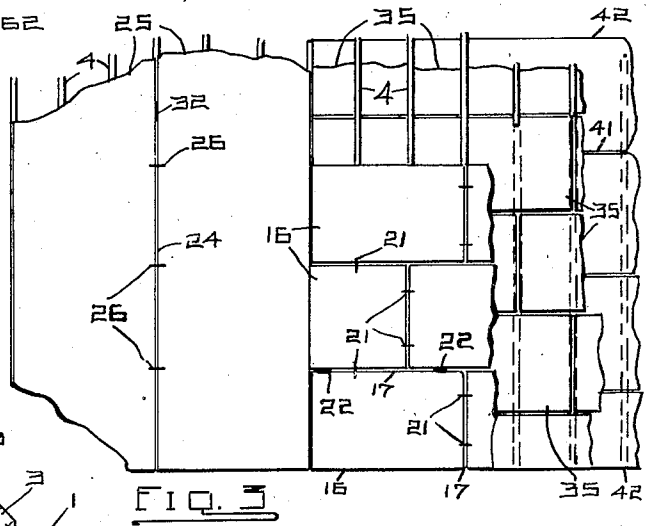


FIG. 3

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July 2, 1946. J. C. HUBER, JR 2,403,369

GLASS BUILDING CONSTRUCTION

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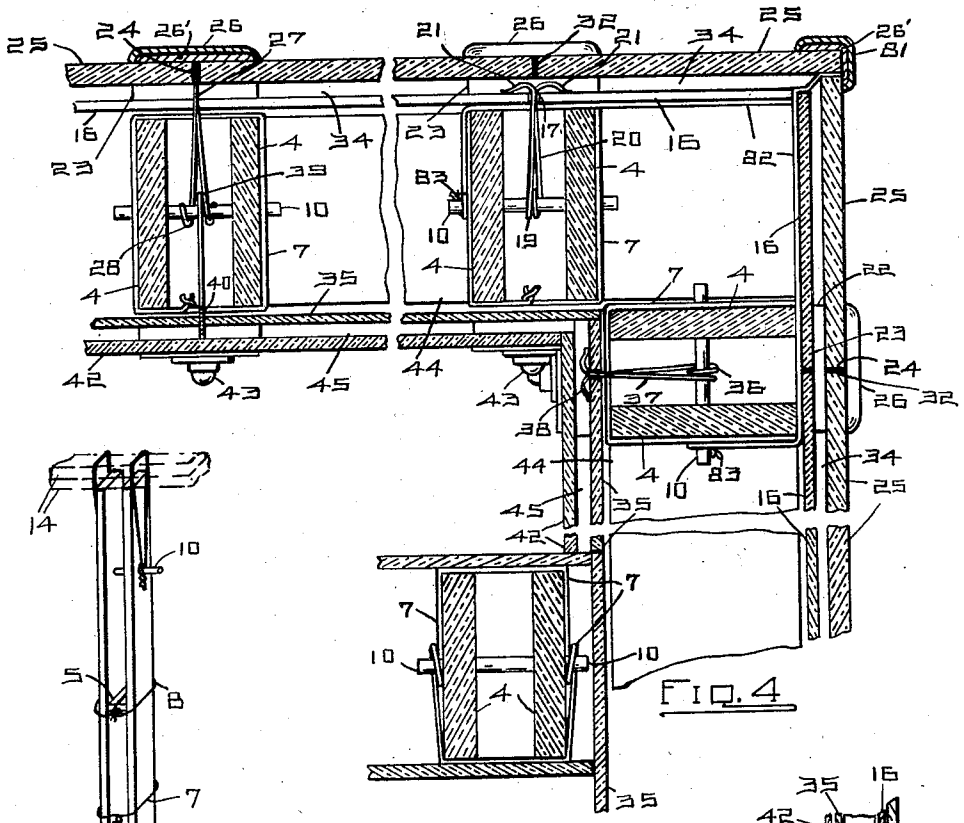


FIG. 4

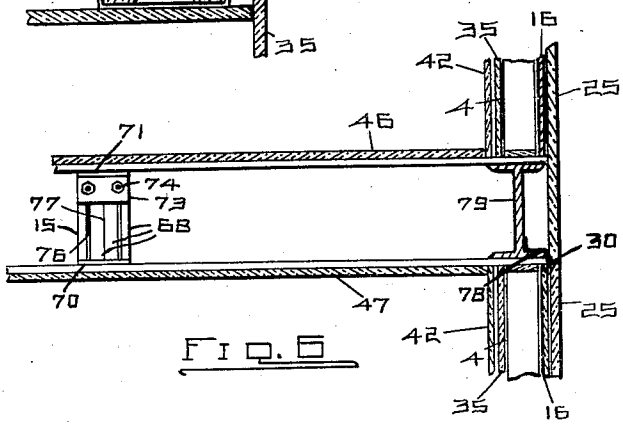


FIG. 6

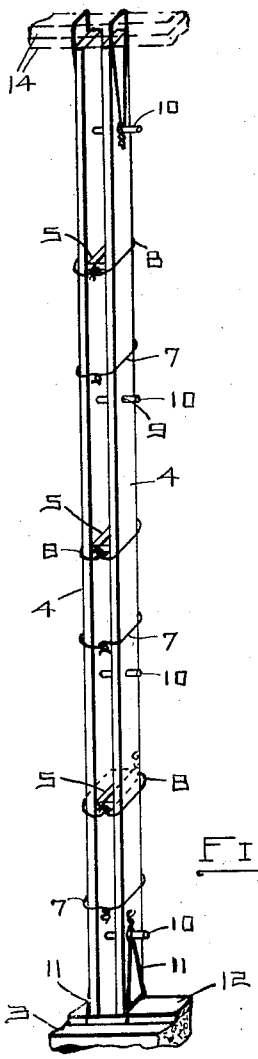


FIG. 5

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GLASS BUILDING CONSTRUCTION

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Application June 21, 1943, Serial No. 491,609

4 Claims. (Cl. 72—16)

1

This invention relates to building construction.

This invention has utility in the matter of assembly of strips, plates, panels and sheet elements into a structure; more particularly of vitreous material, as glass. Hereunder, in the instances from the flat, with range for adaptation in dimension, there is eliminated involved details. Accordingly, one having the urge to build, may, consistently with the simplified program hereunder, proceed as to a desired lay-out or plan, set such up for habitancy, out-building, or even into housings for factory, office building, hospital, church, school, theatre, or any other type of building. The glass building is sanitary, dust proof, vermin-proof, fire-proof, water-proof, permanent, requires no upkeep, will not deteriorate from rust, moisture, dry rot or other causes; and is susceptible to taking down and re-setting without loss, muss or rubbish. The re-construction may be of a similar structure at a different location, and can be added to or remodeled. The desirability traits extend to insulating against any climatic condition in such multiple sealed air chambers for walls, floors and roofs, as experience demonstrates appropriate.

Referring to the drawings:

Fig. 1 is a front elevation, with parts broken away, of an embodiment of the invention in a glass house;

Fig. 2 is a section on line II—II, Fig. 1, partly showing details of window location, and multiple sheet wall from foundation to roof;

Fig. 3 shows, fragmentarily, wall sheets in their assembly on studs, looking from the wall outer side;

Fig. 4 is a section on line IV—IV, Fig. 1, showing wall construction at a building corner, also interior partition adjoining;

Fig. 5 is a detail view of a stud assembly; and

Fig. 6 shows how side walls or plates may be set to enclose upper stories of any building, and shows upper floor construction.

Initial steps are taken according to the character of the building to be erected, location, and soil as well as site conditions. Ground region 1 may have a trench 2 for concrete or other foundation and footing 3. Similar bearing surface may be provided under interior walls. It is desirable that grade 1 have sufficient drainage slope away from the building. In case there be no basement, there may be fill of earth and/or cinders, to provide a bed for hollow block, which may provide ducts for wiring, plumbing piping, and heated air circulation.

For instance for a bungalow type house to have

2

a ceiling 7′ 2″, a convenient prefabrication to supply to the job may be glass studs therefor. To this end a pair o ¼″ thick glass strips 4, wire reinforced where necessary, are of a width of 3″ and 7′ 2″ length. Parallel glass spacers 5 therealong may be 3″ long, ¼″ thick and 1½″ wide, thus giving dimensions 2″ x 3″ for studs. Spacing of studs may be 16″ centers, more or less, as may be suited to dimensions of wall sheets. With studs more sparse, or to withstand more load, strips 4 may be ½″ or more in thickness and any inch width; and likewise as to the number of spacers 5 and wire wraps. For economy in production and simplicity for dimension material to be used hereunder, advantage arises in avoidance of special notching, or boring, and resultant weakening therefrom. Assembly of the strips 4 and the spacers 5 into a stud is effected by stiff or soft pliable rustproof wire, having wraps 7 about strips 4, and additional wraps 8 to position spacers 5 against shifting. Studs shall have ½″ holes 9 about every 18″ for dowel anchors 10 which project outward 1″ or more each way.

Spaced each side of the studs 4, 5, the foundation 3 shall have anchor wires 11. There shall be a continuous base plate 12 stop foundation astride which the studs (Fig. 5) seat thereon. Upper free ends of wires 11 as drawn taut against opposite sides of the studs 4, 5 have a twist 13 about protruding ends of an adjacent dowel 10 and around opposite sides of the studs 4, 5.

At the top of a row of studs 4, 5, are plates 14. Horizontally extending from on the plates 14, are joists 15. These joists 15 are adapted to provide mounting for a floor thereabove and a ceiling at the under side.

The studs 4, 5, provide a skeleton upon which may be mounted plates 16 to form a wall with break-joint clearance 17 between the plates to occur at the studs. The lower edge of the bottom plate 16 may be bedded in elastic putty base 18. Wire end portions 21 from the wire wraps for the studs, are located to be accessible at the clearance regions 17 and there adapted to be twisted to form holding means for the plates 16 against the studs.

Glass furring plates 22 about ¼″ x 2″ x 3″ may be set at studs on plates 16 with transparent glue 23. All joints shall be sealed with elastic putty to form tight insulation spaces between glass plates. Stainless steel caps 26 are soldered 26′ to wire 27 to pass through clearances 24, 17, 21, and have wraps 28 about the dowel 10.

With frieze strips 29 held by hooks 30 from the

top of the plates 25, outer finish downward has only vertical clearance lines 24 of 1/8" width, with caps 26 spaced therealong, and vertical joints filled flush with elastic putty 32, with bedding and finish bevel 33 at the foundation 3 (Fig. 2). The running of wires 27 from caps 26 through joints between the outer plates 25 must be at a register of crosswise joints.

Between the plates 16, 25, there is a dead air or insulation space 34. In some practice additional insulation spaces may be effected by inclusion of more plates and/or multiple Cellophane sheets between the wall of the plates 16 and wall of the plates 25; between wall of the plates 35 and wall of the plates 42; and between wall of plates 48 and wall of plates 50.

Upon completion of setting of plates for wall on outside of the studs, the erector may locate a group of plates 35 bedded at stud wire wraps with elastic putty on inner side of studs. Plates 35 and plates 16 may be similar. All joints should be sealed with elastic putty. After anchor wires terminate in a twist, they have their ends 38 spread flat against surfaces 35 drawing such wall layer into wall assembly. Hooks 39 caught over dowels 10, with threaded portions 40 protruding through clearance 41 between generally horizontally extending inner wall finish plates 42, have plates, washers, caps 43 threaded with hook portion 40 as anchorage.

There is in the disclosure herein a four-ply wall with three air chambers for insulation. More air chambers may be used as climatic conditions require. Avoidance of register of joints at other than intersections between plates of one layer and of layers parallel thereto, contributes to maintenance of separation of air chambers and to stability. Joint sealing is a further carrying forward of full separation between chambers 34, stud spacing chamber 44 and chamber 45.

Appropriate non-skid glass plates 46 form the floor finish. Suspended glass plates 47 form the ceiling. To the extent insulation values are attained for side walls, there may be on joists 15 horizontal glass plates 48 with furring plates 49 spaced thereover at joints, with roof glass plate sections 50 thereon. Joints of floor, ceiling, roof and all insulation glass shall be sealed with elastic putty.

Glass hood 52 may be held by struts 53 at entrance door 54. Anchorage for metal posts 55 may position such posts to carry guard rails 56 as roof bounds for a deck provided by floor 50. A chimney 57 may have glass plates 58 as veneer over masonry. A cantilever joist structure 59 from chimney 57 may have transparent glass plate roof 60. To form sleeping room on main roof, curtains 61 may be lowered.

Window openings 62 are made of jamb plates 63 between plates 25 and 42. Sill 64 has projection 65, two-ply insulation glass plate section 66, set with top and bottom clips and sealed with elastic putty 67. Other than to locate frames for swinging doors, there need be no wood or other casing, base or trim of any kind.

The glass joist or beam 15 is built up from plates 68 as strips of glass in on-edge parallel relation, with or without, as exigency requires, glass bottom plate 70 and upper plate 71. Inter-plate tension metal members 72 have metal supports at one or two points at bottom of glass in span length and metal blocks or washers 73 at upper supported ends of joint or beam, with nut or anchorage means 74 to hold ends of tension

member or members 72 and wire wraps 75 about joist or beam to maintain the assembly. In some practice, the studs, joists, beams may be precast glass with metal reenforcing rods and wire wraps inside. Some practice may give importance to the degree of translucency for the side walls as completed, even apart from the transparency of window space, and/or window space may be increased or entirely omitted.

Exposed glass edges are preferred to be finished rather than sharp cut. The structural set-up, where uniform thickness rolled or drawn sheet flat glass faces are directly against each other, is desirable to have same set with transparent waterproof glue. The elastic putty used to seal joints may be cut flush to surfaces; while otherwise concealed, or as exposed to weather on chimney, or roof, it may be a slight excess.

For door hood, floor tile, roof or deck, or any other parts requiring same, wire glass may be adopted.

The exterior wall construction (glass studs with exterior and interior glass finish plates and insulation chambers), the floor construction (glass joists with glass floor and ceiling plates), roof construction (glass joists with glass roof and ceiling plates and insulation chambers), and interior partitions (glass studs and walls) may all be used for buildings of few stories, the same as described for the bungalow. Similarly, all this construction may be used for the completion of multi-storied buildings of steel framing, or other skeleton framing.

The showing (Fig. 6) is a metal beam, joist or girder 79 with a continuous Z-bar 80 welded thereto. Z-bar 80 is here shown to carry outer plates 25 for each story upward.

At exposed outer corners of the building, angle caps 81 may have wires 82 therefrom to wend through joints between plates 25 and 16, thence around a stud outer side to have twist anchorage 83 at dowels 10 or around any wrap wires of studs. With each angle cap 81 thus pulled taut each way and anchored to corner studs, there is completed rigid assembly.

In view of the possibility hereunder of glass practically throughout, the resultant structure avoids hazard from lightning, and with translucency affords maximum light. Razing and reconstructing does not involve loss, waste nor rubbish. The glass building is airtight, dry, avoids moisture problems, and there is no seasoning, drying out or shrinkage. The glass will come to job ready to set in place, with but the simplest of labor and only two tools required for erection—pliers and putty knife. The glass once set, the structure is completed, with no need for many involving materials and trades, as the interior and exterior are of themselves finished.

What is claimed and it is desired to secure by Letters Patent is:

1. A building unit comprising a plurality of framing elements, and facing panels applied to opposite faces of said elements, each framing element comprising a pair of elongated strips, means for maintatining said strips in spaced parallel relation, pins extending through said strips and bridging said space, said elements being positioned with their long edge faces directed toward the facing panels; adjacent panels being positioned with their end edge portions overlying a space between a pair of the strips forming a framing element, said edge portions there being in substantial abutment, and means having a part engaging the outer faces of adjacent wall panels

and another part extending between said abutment-approaching edge portions and attached to said pins for securing said panels in assembled relation with said framing elements.

2. A building unit comprising a plurality of framing elements, and facing panels applied to opposite faces of said elements, each framing element comprising a pair of flat side strips, interposed rigid means resting against opposing flat sides of the pair of strips to maintain the strips in spaced parallel relation, said elements being positioned with their long edge faces directed toward the facing panels; adjacent panels being positioned with their edge portions overlying a space between a pair of the strips forming a framing element, said edge portions of the panels there approaching substantial abutment, and means having a part engaging the outer faces of adjacent wall panels and extending therefrom between said abutment-approaching edge portions and provided with anchorage connection with the assembled strips of the framing element.

3. A building unit comprising a plurality of framing elements, and facing panels applied to opposite faces of said elements, each framing element comprising a pair of elongated flat strips, rectangular flat plates with their bounding edges determining planes transversely of the extent of the strips for maintaining the strips in spaced parallel relation, pins extending through said strips to protrude from opposite sides thereof and bridging the space, said elements being positioned with their long edge faces directed toward

the facing panels; adjacent panels being positioned with their end edge portions overlying a space between a pair of the strips forming a framing element, said edge portions there approaching substantial abutment, and means engaging the outer faces of adjacent wall panels and extending therefrom between said abutment-approaching edge portions and attached to said pins for securing said panels in assembled relation with said framing elements.

4. A building unit comprising a plurality of framing elements and facing panels of flat glass applied to opposite faces of said elements, each framing element comprising a pair of elongated flat glass strips, flat glass spacing blocks for maintaining the strips in spaced parallel relation, said framing element strips having perforations in alignment, pins extending through said perforations of the respective strips and bridging the space, said elements being positioned with their long edge faces directed toward the facing panels; adjacent panels being positioned with their end edge portions overlying a space between a pair of the strips forming a framing element, said edge portions there approaching substantial abutment, and wire means having a part engaging the outer faces of adjacent wall panels and another part extending between said abutment-approaching edge portions and attached to said pins for securing said panels in assembled relation with said framing elements.

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