Feb. 19, 1924. 1,484,206

J. A. BIRKHOLZ

BUILDING UNIT

Filed Oct. 9, 1920 2 Sheets-Sheet 1

Fig. 1

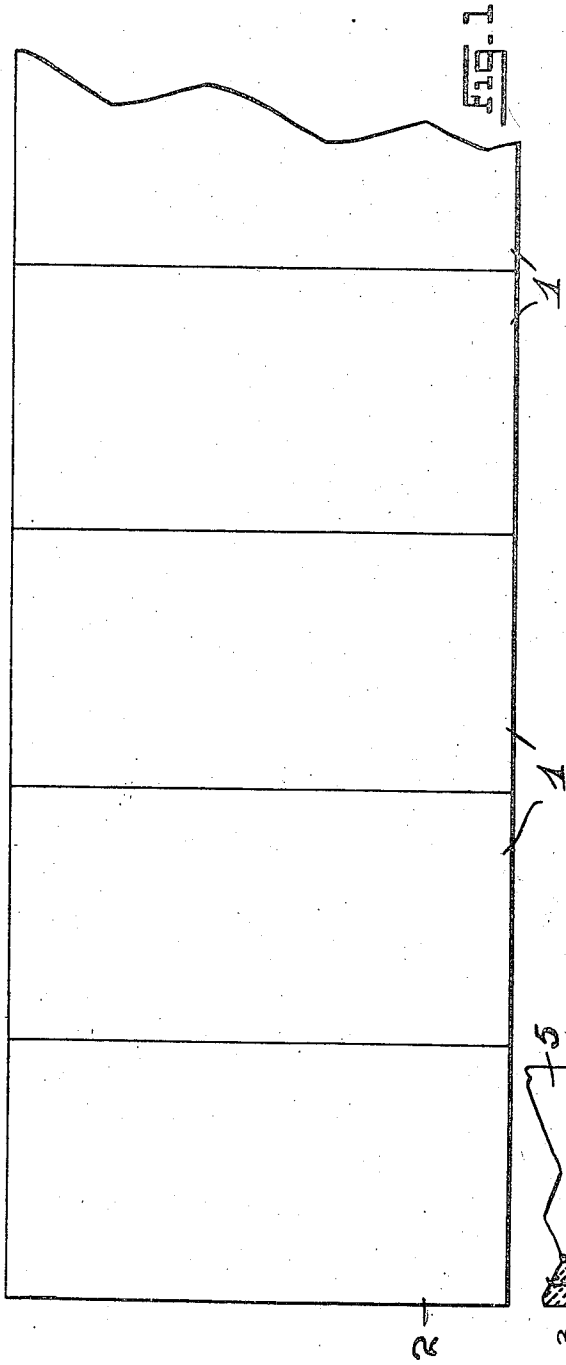
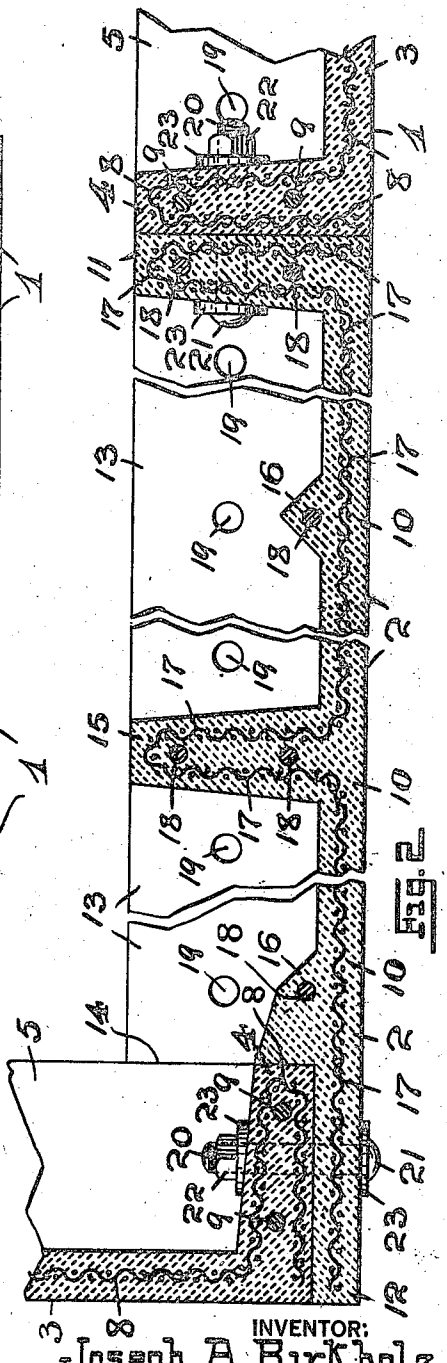


Fig. 2



INVENTOR:
Joseph A. Birkholz,
BY
Fraentzel and Richards,
ATTORNEYS.

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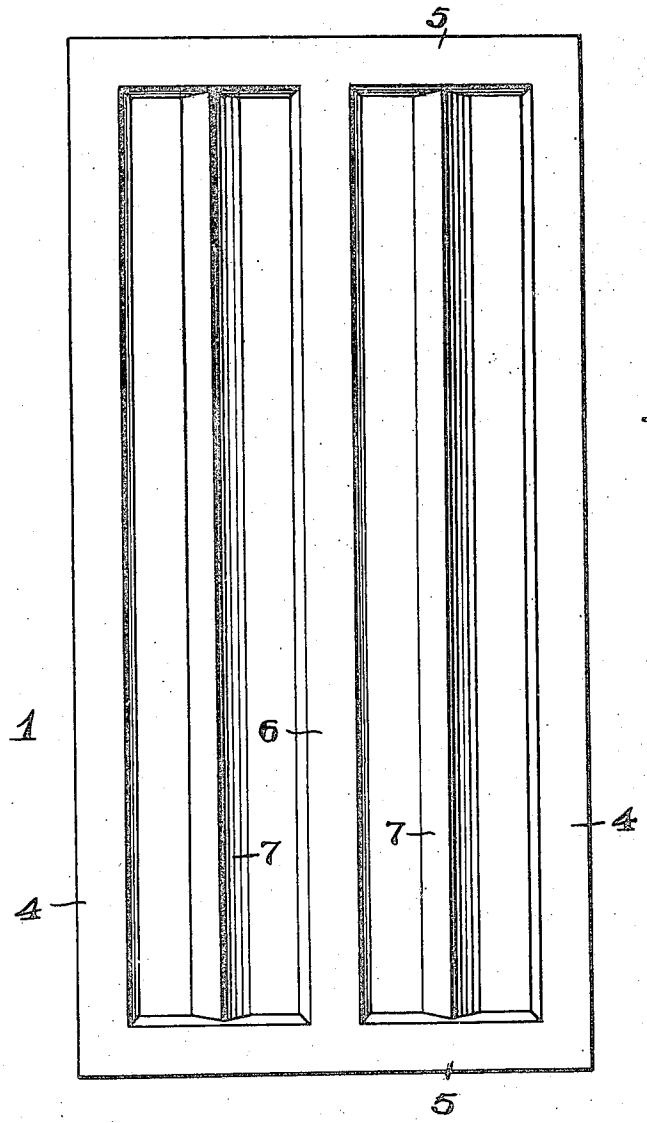


Fig. 3

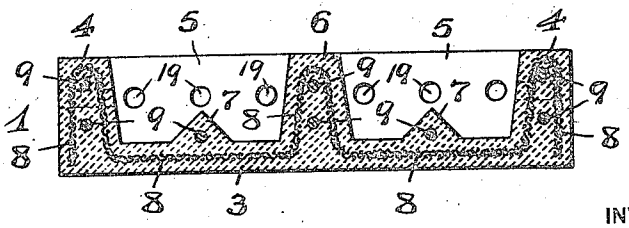


Fig. 4

INVENTOR:
Joseph A. Birkholz,
BY
Fraentzel and Richards,
ATTORNEYS.

Patented Feb. 19, 1924. 1,484,206

UNITED STATES PATENT OFFICE.

JOSEPH A. BIRKHOLZ, OF ORANGE, NEW JERSEY.

BUILDING UNIT.

Application filed October 9, 1920. Serial No. 415,897.

To all whom it may concern:

Be it known that I, JOSEPH A. BIRKHOLZ, a citizen of the United States, residing at Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Building Units; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

This invention relates, generally, to improvements in construction materials for use in the general construction of buildings, and similar structures; and, the present invention has reference, more particularly, to a novel building unit made of a plastic material, as concrete, which is molded so as to provide a portable pre-cast concrete wall-unit having upright edges which form studs, and top and bottom portions comprising the plate and sill-members of a wall-structure, respectively.

The present invention, therefore, has for its principal object to provide a novel and simply-constructed portable and pre-cast building unit, which may be made of concrete or other analogous material, and of the general character hereinafter set forth.

The invention has for its further object to provide building units of the general form and construction hereinafter stated, each unit being made with marginal re-inforcing ribs or uprights which form studs, the studs of the abutting or adjacent units being adapted to be placed in contacting relation with one another, and then permanently secured in fixed assembled relation, by an arrangement of tying bolts, or other suitable fastening means.

The invention has for its further object to provide a portable pre-cast concrete wall unit having upright edges which form studs, and top and bottom portions comprising the plate and sill members of a wall-structure, respectively, and a curtain-wall between and connected with the said studs and the said plate and sill members.

Other objects of this invention not at this time more particularly enumerated will be clearly understood from the following detailed description of the present invention.

With the various objects of the present invention in view, the said invention consists, essentially, in the novel portable pre-cast wall unit hereinafter more fully set forth; and, the invention consists, furthermore, in the novel arrangements and combinations of the several devices and parts, all of which will be more fully described in the following specification, and then finally embodied in the clauses of the claims, which form an essential part of the said specification.

The invention is illustrated in the accompanying drawings, in which:—

Figure 1 is a front elevation of a portion of a wall, showing in connection therewith, and in front face view, a number of the building units made according to and embodying the principles of the present invention; and Figure 2 is a horizontal sectional representation of such building units, showing in connection therewith one means of securing said units in their assembled relation, said view being also made on an enlarged scale.

Figure 3 is a rear face view of a single building unit; and Figure 4 is a cross sectional representation of the same.

Similar characters of reference are employed in the said above described views, to indicate corresponding parts.

Referring now to the said figures of the drawings, the reference-character 1 indicates in general, building units made according to and embodying the principles of the present invention, and the reference-character 2 indicates a building unit, embodying the principles of the present invention, but varying slightly in its detail construction from the units 1, so as to be adapted for use at the corner or angle of a wall.

Referring now more particularly to Figures 3 and 4 of the drawings, it will be seen that the unit 1 is generally of rectangular conformation, being usually two feet in width and eight feet in length, but such dimensions, however, may be varied at will, as may be desired, and said unit consists, essentially, of a body 3 moulded in any suitable material, preferably concrete, said body being substantially smooth or flat upon one face, and said body being provided upon its opposite face with re-enforcing ribs or members as 4 and 5, extending rearwardly from the respective marginal edge-portions of said body 3. The said rear face of the body 3 is also formed with a centrally dis-

posed rib or member, as 6, which extends longitudinally of said rear-face from and between the two end-ribs or members 5 of the slab or board thus provided. In addition to the above mentioned ribs, the said body 3 may also be provided, intermediate the longitudinally extending ribs or members 4 and 6, with other longitudinally extending ribs 7, between the end-ribs or members 5, each rib being preferably V-shaped in cross-section.

Imbedded interiorly within the ribs or members 4, 6 and 7, and within the body 3 is a strengthening or re-inforcing element 8, of wire mesh, or other similar material. Furthermore, the various ribs or members 4, 6 and 7, may also be re-inforced or strengthened, by having imbedded therein suitable re-inforcing rods, as 9, substantially as indicated in the several figures of the drawings.

Referring now to the slab or unit 2 which is ordinarily employed at the corner of a wall, it will be seen from an inspection of Figure 2 of the drawings, that the body 10 of this slab or unit is formed with but one rearwardly projecting and longitudinally extending rib or member 11, the marginal edge-portion 12 of the body 10 having the longitudinally extending marginal rib omitted therefrom, and the marginal end-ribs 13, being cut-away, as at 14, see Figure 2, so that the angularly placed unit 1, forming part of the corner of the wall, can be fitted against and joined to the unit or slab 2 in a manner as shown in said Figure 2. The said unit or slab 2 may also be made with re-inforcing ribs or members 15 and 16, extending longitudinally from the two short end-ribs or members 13, substantially as shown. The said slab or unit 2 may also have imbedded interiorly within the said ribs or members 11, 15 and 16, a strengthening or re-inforcing element 17, of wire mesh, or similar material, and the said ribs 11, 15 and 16, may also be re-inforced or strengthened, by having imbedded therein suitable re-inforcing rods, as 18.

To provide a wall, or the like, the various units are disposed in assembled relation, either side by side, or end by end, or both, and to permanently secure the units together, the various marginal ribs are provided with suitably placed holes or perforations 19 for the reception of tightening bolts 20, said bolts having suitable enlargements or heads 21, and tightening nuts 22, with suitable washers 23 mounted upon each bolt, and disposed against the exposed faces of any two abutting flanges, or as arranged at the corner of the wall, as will be clearly understood from an inspection of Figure 2 of the drawings.

From the foregoing description and from an inspection of the drawings of the present invention it will be clearly evident that I have devised a novel and simply constructed portable pre-cast concrete wall-unit having upright edges which form studs, and top and bottom portions comprising the plate and sill members of a wall-structure, respectively; furthermore the various members of each frame section i. e. sill, plate, two side studs, either with or without the auxiliary studs, or cross braces, are all cast or moulded in one unit.

A reinforced concrete curtain wall is cast between each of the frame members, thus forming in one single and portable unit a complete side wall section consisting of sill, plate, studs, auxiliary studs, cross braces and curtain wall.

By this method of fabricating all frame members in one unit, and connecting all frame members together with a curtain wall as part of the same unit, each member acts as a reinforcing brace and support to each other member, and when erected in a building, the side studs of adjacent sections are bolted or otherwise secured together and form a continuous weatherproof joint from sill to plate without the necessity of any mortar or cement bond.

The side studs of the adjacent sections thus fastened together form a series of reinforced concrete pillars around the entire wall of the building, and since these pillars are braced and supported by the other frame members, they carry the entire roof-load, as well as all other stresses or strains to which the side walls are subject, whereby it is possible to make the curtain wall very thin, and thus cut down the weight of the side walls for convenient handling, without sacrificing durability or efficiency.

While in the foregoing description I have described, and in the accompanying drawings I have illustrated one construction of building unit, in the form of a slab, which shows one embodiment of the principles of the present invention, still I am fully aware that some changes may be made in the general arrangements and constructions of the various parts without departing from the scope of the present invention as set forth in the foregoing specification, and as defined in the clauses of the claims which are appended thereto. Hence, I do not limit my invention to the exact arrangements and combinations of the various parts as described in the said specification, and as illustrated in the accompanying drawings.

I claim:—

1. A portable pre-cast concrete wall-unit having upright edges which form studs, and top and bottom portions comprising the plate and sill members of a wall-structure, respectively, said stud-members being adapted to carry substantially the entire weight that is imparted thereto.

2. A portable pre-cast concrete wall-unit

having upright edges which form studs, top and bottom portions comprising the plate and sill members of a wall-structure, respectively, said stud-members being adapted to carry substantially the entire weight that is imparted thereto, and a curtain-wall between and connected with said studs and the said plate and sill members, the said curtain-wall being thin and having substantially no weight-carrying capacity.

3. A portable pre-cast concrete wall-unit having upright edges which form studs, top and bottom portions comprising the plate and sill members of a wall-structure, respectively, said stud-members being adapted to carry substantially the entire weight that is imparted thereto, and an intermediately disposed re-inforcing member.

4. A portable pre-cast concrete wall-unit having upright edges which form studs, top and bottom portions comprising the plate and sill members of a wall-structure, respectively, said stud-members being adapted to carry substantially the entire weight that is imparted thereto, an intermediately disposed re-inforcing member, and a curtain-wall between and connected with said studs and the said plate and sill members, the said curtain-wall being thin and having substantially no weight-carrying capacity, and also with said re-inforcing member.

5. A building unit in the form of a slab, comprising a body having a substantially smooth surface forming the face of the slab, longitudinally and laterally extending marginal re-inforcing ribs extending rearwardly from said body, a longitudinally projecting and centrally disposed re-inforcing rib located between the longitudinally extending marginal ribs, a V-shaped longitudinally extending rib located between each longitudinally extending marginal rib and the centrally disposed re-inforcing rib, said marginal ribs being provided with perforations for the reception of tightening bolts for securing adjacent slabs side by side, or end to end, in assembled relation.

6. A building unit in the form of a slab, comprising a body having a substantially smooth surface forming the face of the slab, longitudinally and laterally extending marginal reinforcing ribs extending rearwardly from said body, a longitudinally projecting and centrally disposed re-inforcing rib located between the longitudinally extending marginal ribs, a V-shaped longitudinally extending rib located between each longitudinally extending marginal rib and the centrally disposed re-inforcing rib, a wire-mesh re-inforcing element imbedded within said body and said longitudinally extending marginal ribs and said centrally disposed rib, and re-inforcing rods imbedded in said ribs.

In testimony that I claim the invention set forth above I have hereunto set my hand this 5th day of October, 1920.

JOSEPH A. BIRKHOLZ.

Witnesses:

FREDK. C. FRAENTZEL,

EVA E. DESCH.