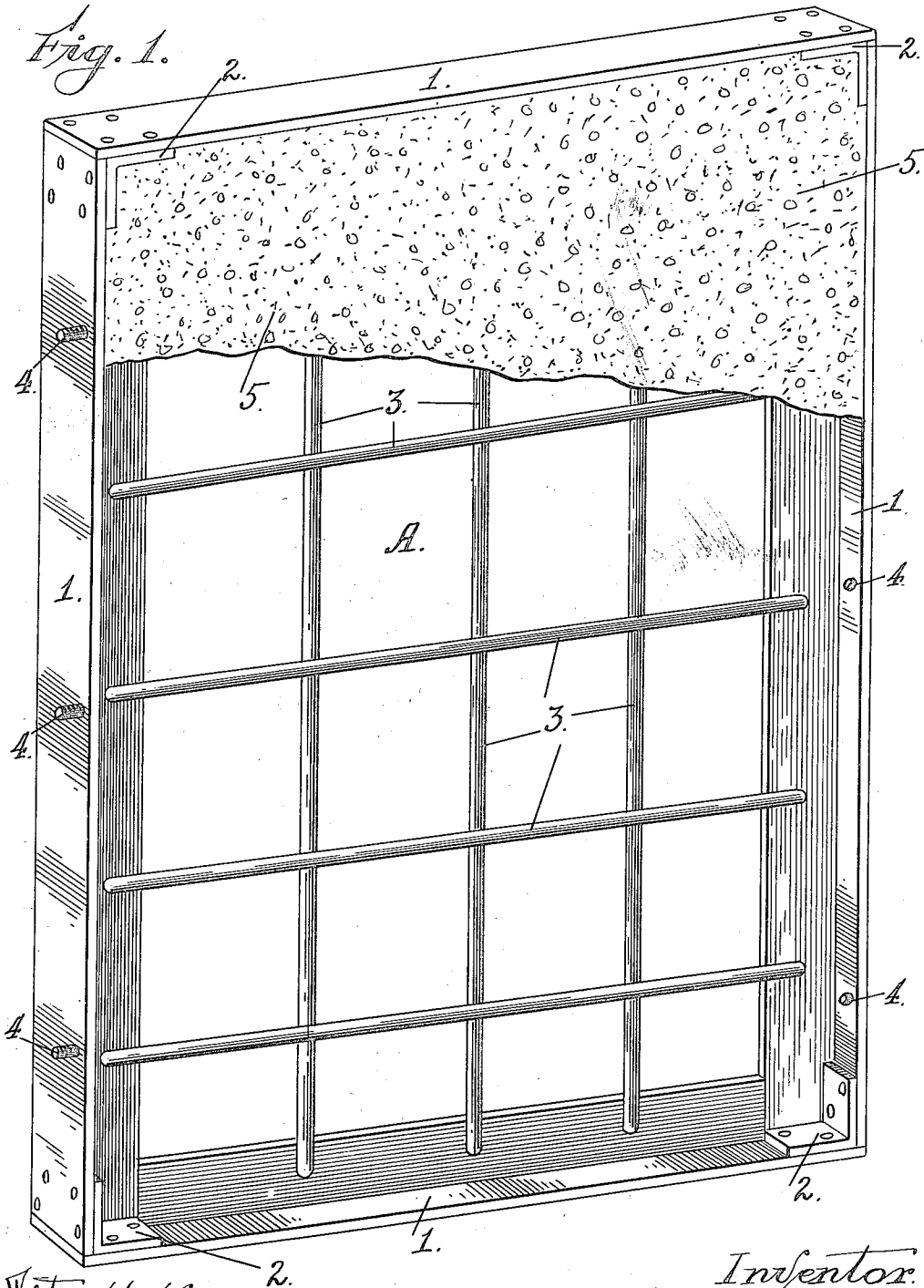


G. W. HANSBROUGH.
BUILDING CONSTRUCTION.
APPLICATION FILED MAR. 23, 1911.

1,031,926.

Patented July 9, 1912.

8 SHEETS—SHEET 1.



Witnesses:
Arthur L. Slee.
S. Constine.

Inventor:
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by Wm F. Booth
his Attorney.

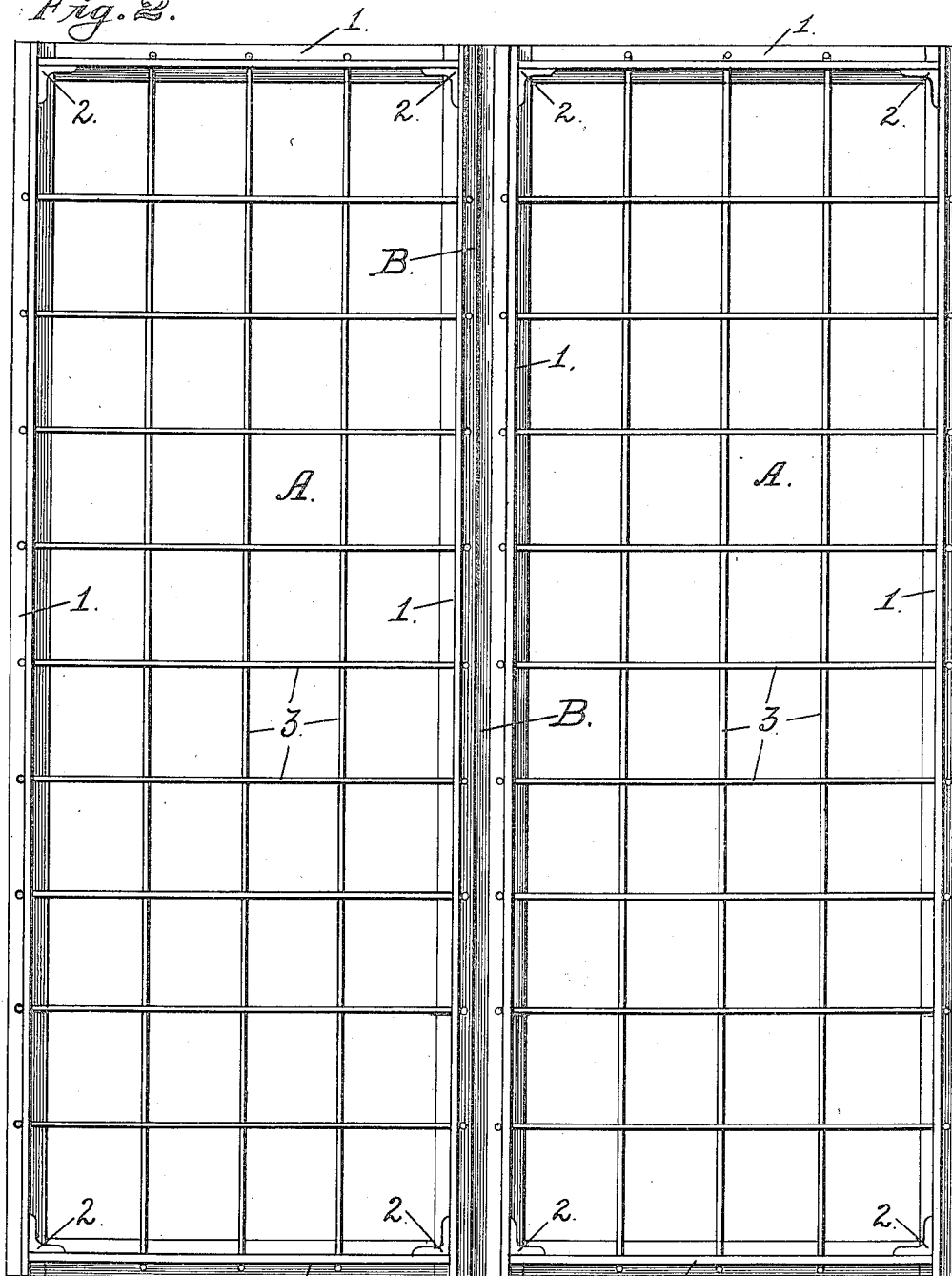
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8 SHEETS-SHEET 2.

Fig. 2.



Witnesses:
Arthur L. Lee.
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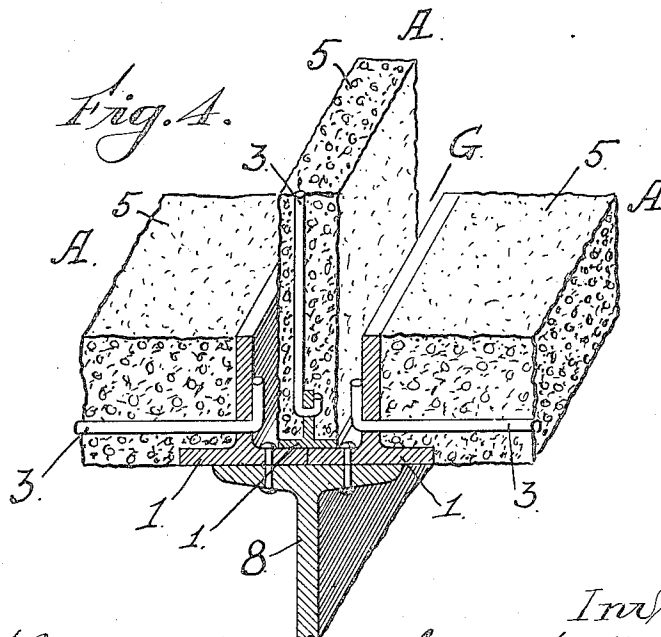
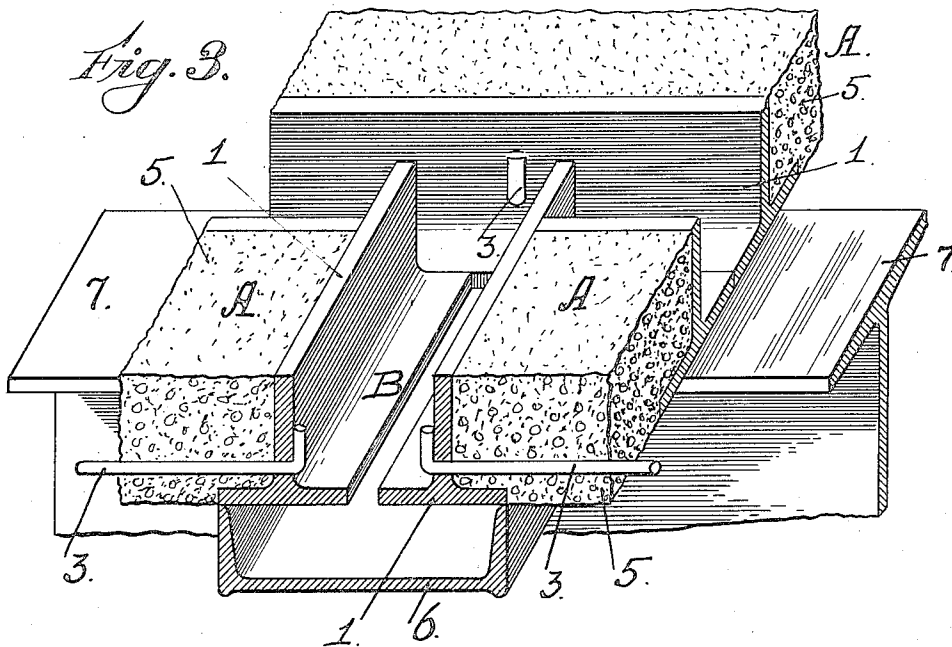
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8 SHEETS—SHEET 3.



Witnessed:
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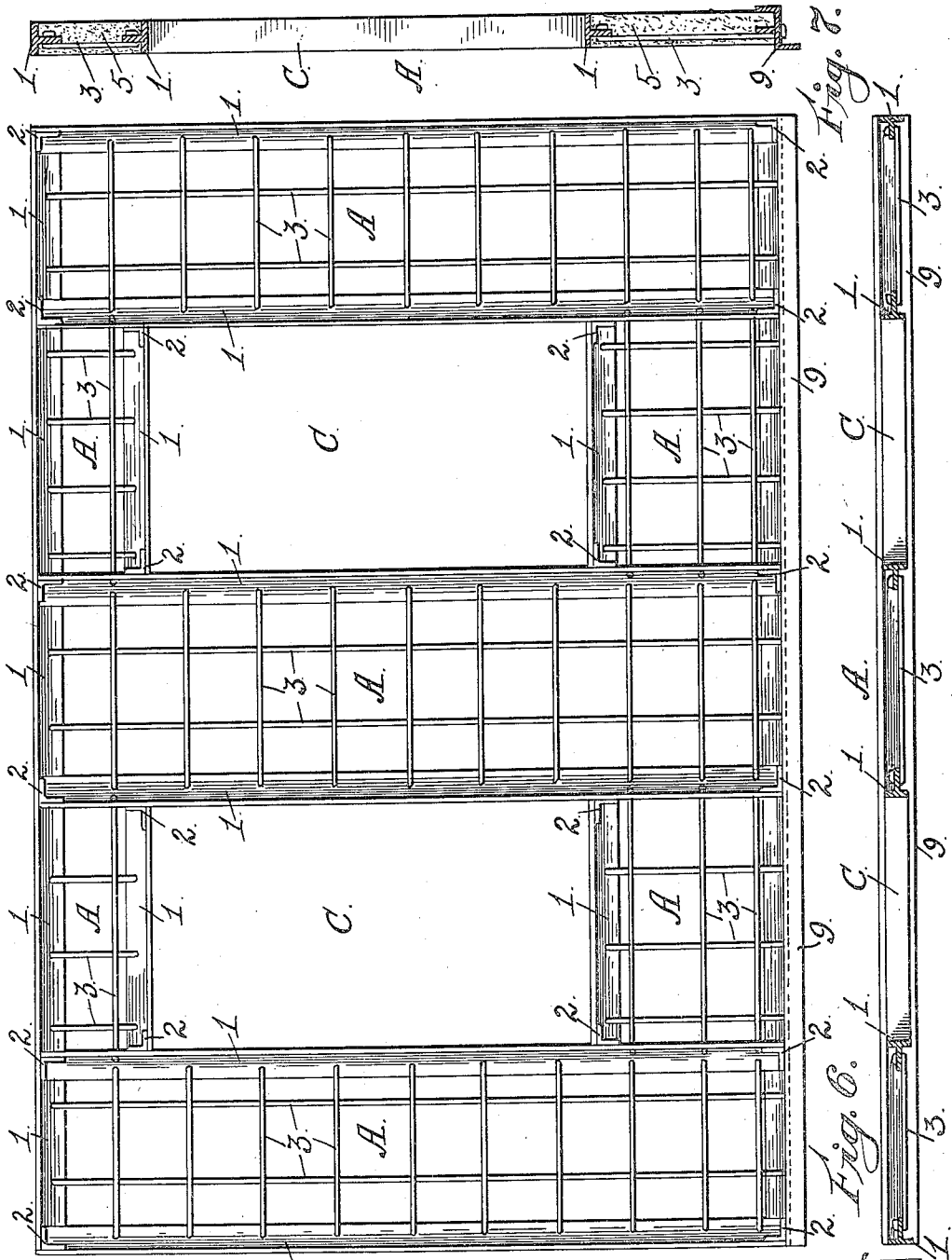
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8 SHEETS—SHEET 4.



Witnesses:
Arthur L. Slee.
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Fig. 5.

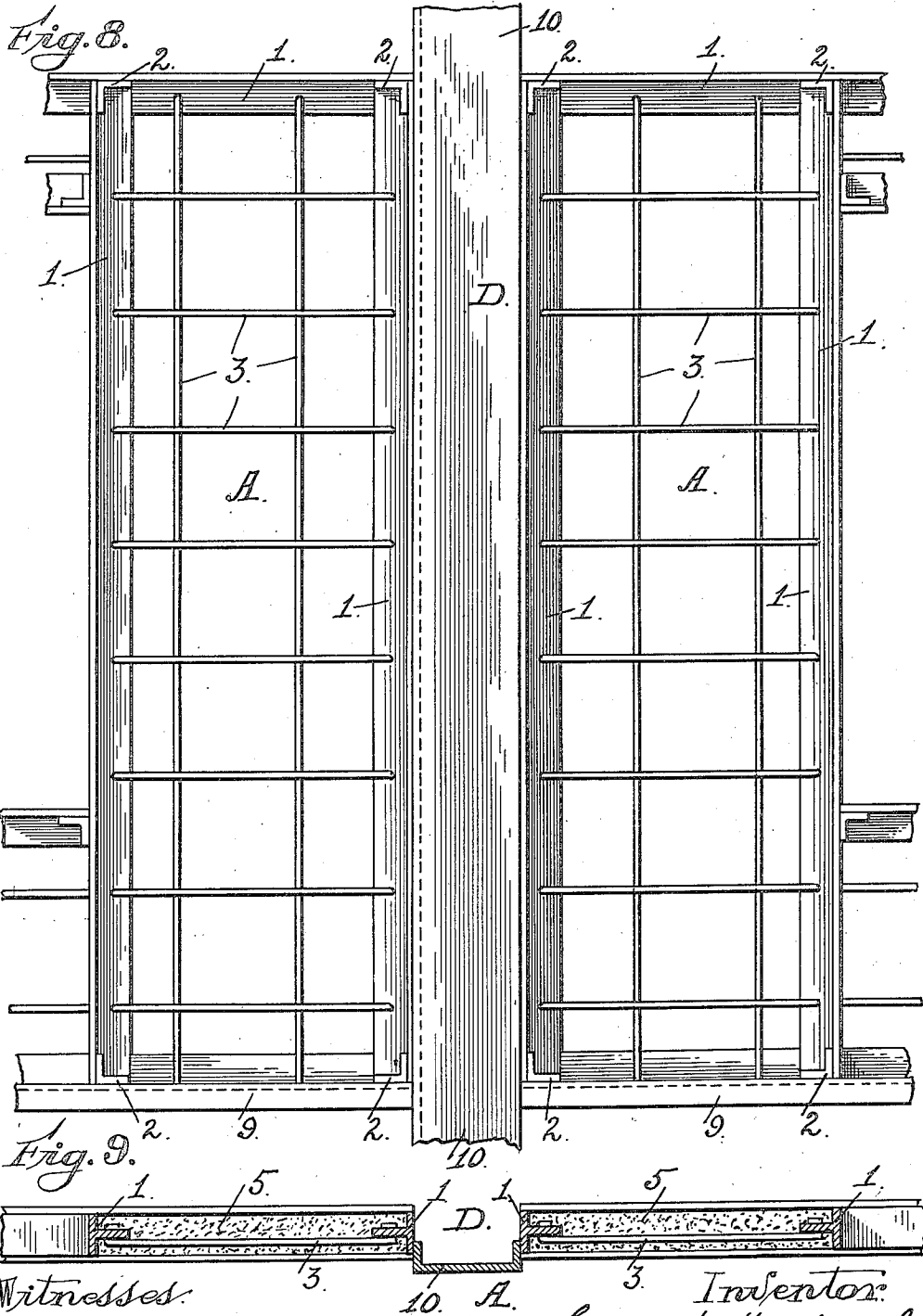
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8 SHEETS—SHEET 5.

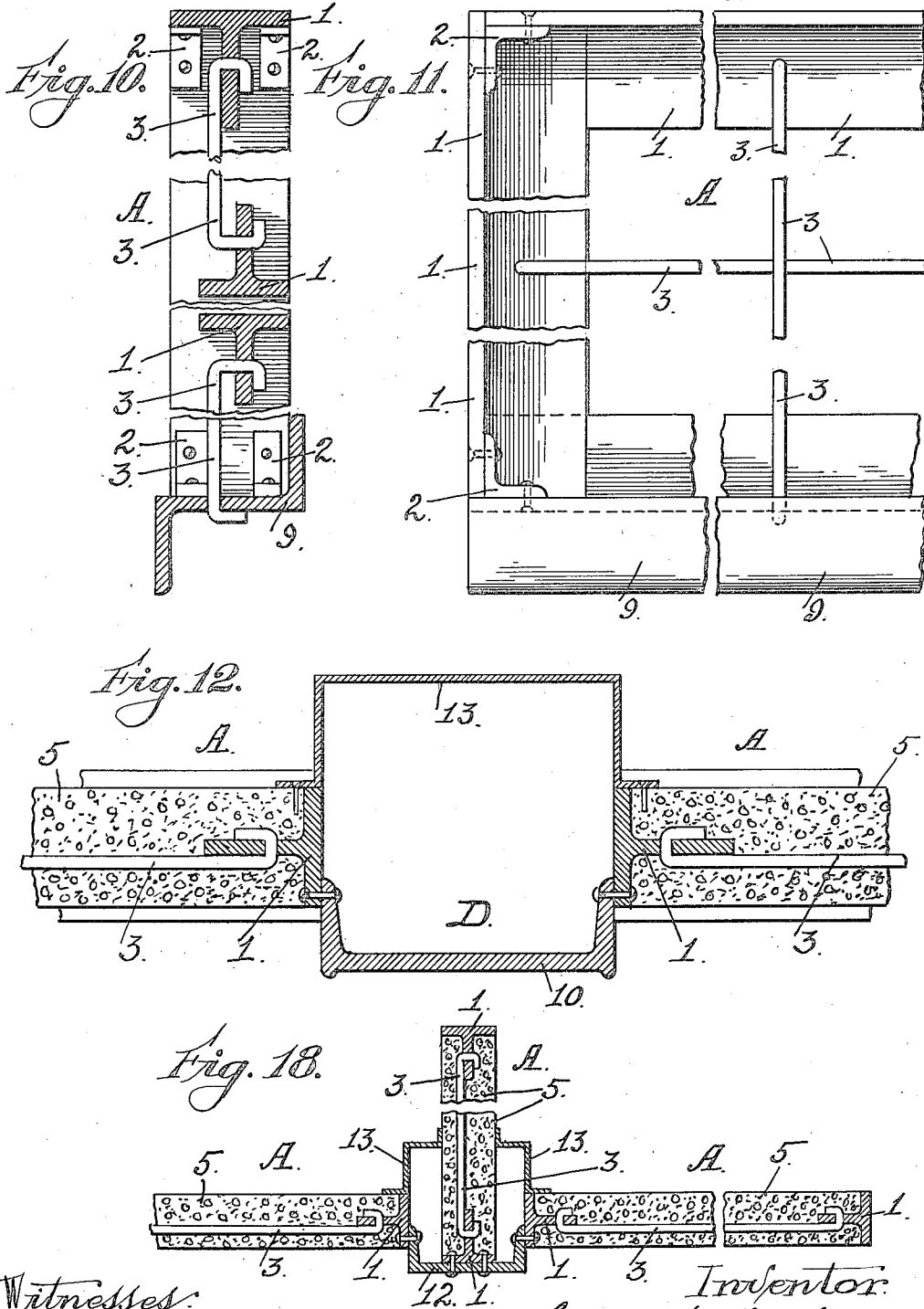


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8 SHEETS—SHEET 6.



Witnesses:
Arthur L. Slee,
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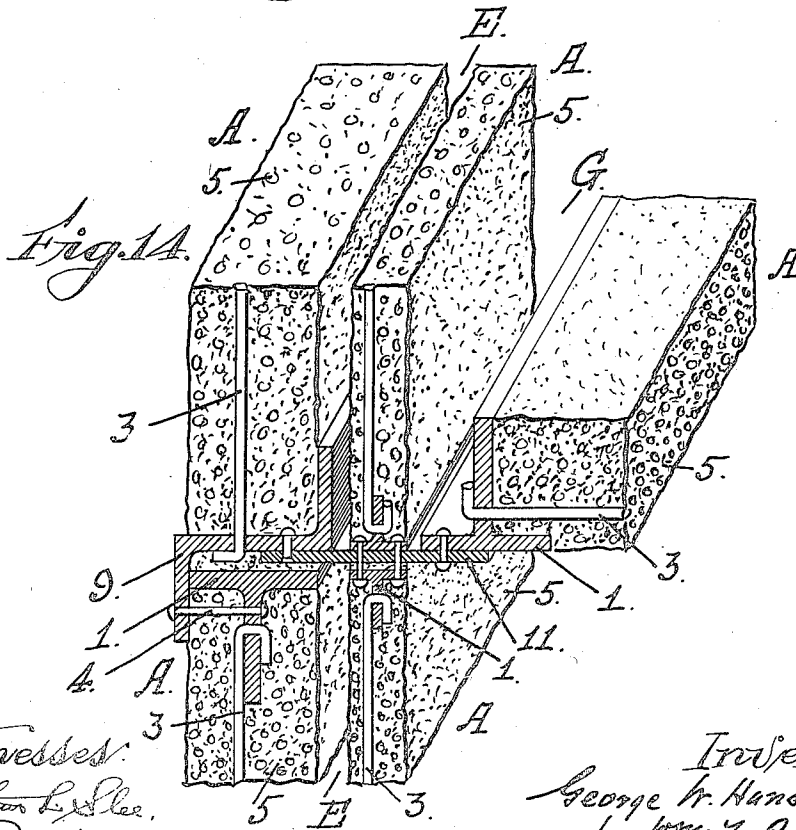
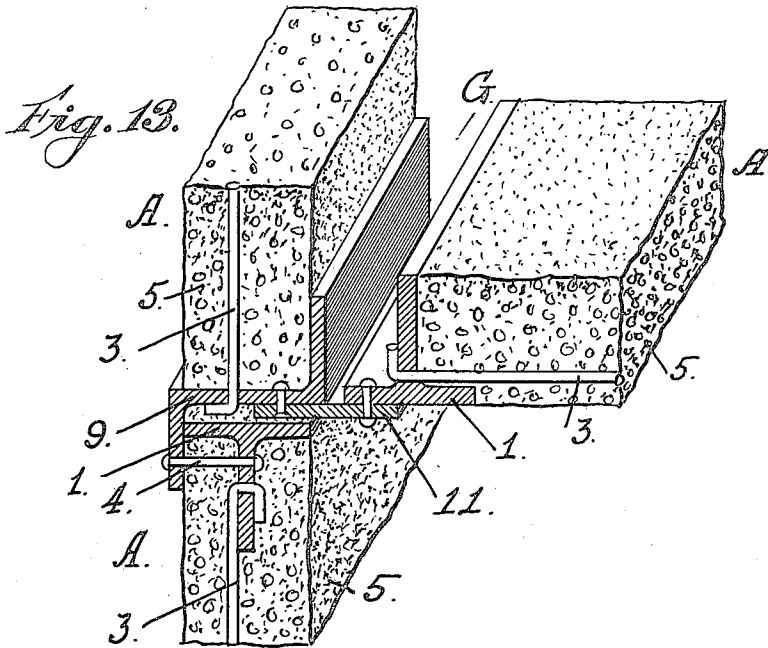
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8 SHEETS—SHEET 7.



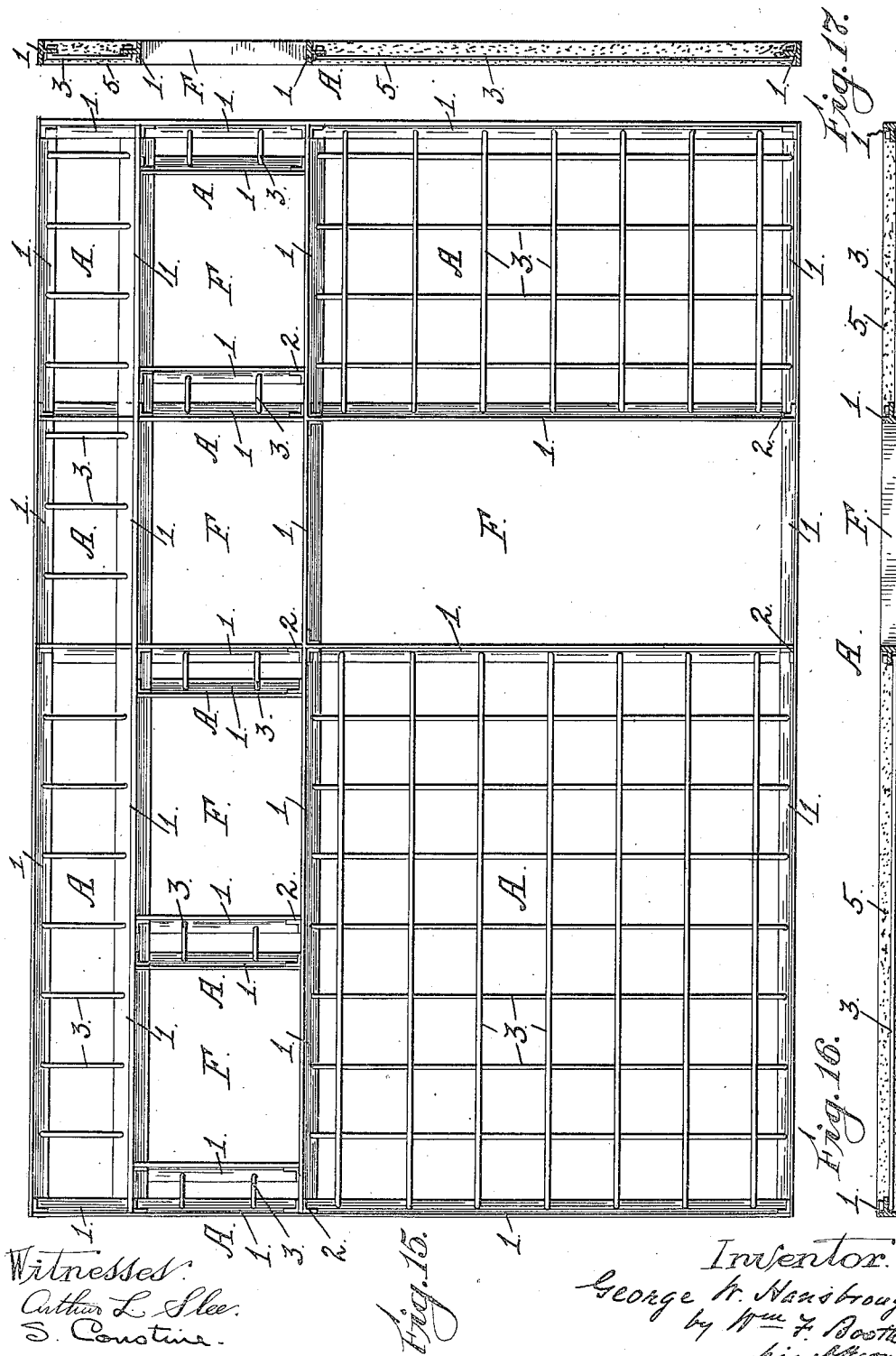
Witnesses:
Arthur L. Lee,
S. Constantine.

Inventor:
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1,031,926.

G. W. HANSBROUGH.
BUILDING CONSTRUCTION.
APPLICATION FILED MAR. 23, 1911.

Patented July 9, 1912.
8 SHEETS—SHEET 8.



UNITED STATES PATENT OFFICE.

GEORGE W. HANSBROUGH, OF SAN FRANCISCO, CALIFORNIA.

BUILDING CONSTRUCTION.

1,031,926.

Specification of Letters Patent.

Patented July 9, 1912.

Application filed March 23, 1911. Serial No. 616,324.

To all whom it may concern:

Be it known that I, GEORGE W. HANSBROUGH, a citizen of the United States, residing in the city and county of San Francisco and State of California, have invented certain new and useful Improvements in Building Construction, of which the following is a specification.

My invention relates to a building construction of the steel concrete type.

My invention consists essentially in the novel panel unit which I shall hereinafter fully describe, and which by its construction lends itself for aggregate use in all situations of the building construction, many of which situations and uses I shall herein fully illustrate and describe, in order to render clear the utility and objects of the invention.

The essential object of my invention is to produce a more economical and simplified building construction.

The attainment of these ends will appear in detail in the course of the following description.

Referring to the accompanying drawings it will be noted that in the figures the concrete is either omitted or is shown broken away or is merely indicated. This is for the sake of clearness.

Figure 1 is a perspective view of a panel unit, part of the concrete being broken away. Fig. 2 is a plan of two panel units in a floor construction, disposed to form an intervening conduit. Fig. 3 is a fragmentary perspective view showing three panel units of a floor construction jointed together over a steel girder support. Fig. 4 is a fragmentary perspective view showing, in a floor construction, the jointing together over a steel girder support of two panel units and the foot of a panel unit of a partition construction. Fig. 5 is an elevation of what I will term an aggregate panel unit; that is, one composed of a plurality of connected panel units, said aggregate panel unit being intended to form part of an exterior wall of a building, with openings for windows or other surface openings. Fig. 6 is a horizontal section through the openings of Fig. 5. Fig. 7 is a similar vertical section. Fig. 8 is an elevation showing the adjacent ends of the aggregate panel units of Fig. 5 jointed together. Fig. 9 is a horizontal section of the same. Fig. 10 is a broken sectional view, enlarged of the section of Fig.

7. Fig. 11 is an elevation of the same. Fig. 12 is a fragmentary section, showing two panel units joined by a steel bar 10 as in Fig. 9, and showing in addition, at the juncture, a pilaster treatment at 13. Fig. 13 is a fragmentary perspective view showing the jointing together of two exterior-wall aggregate panel units connected at top and bottom edges, and anchored to a floor panel unit. Fig. 14 is a view similar to Fig. 13, showing in addition two thinner panel units inserted to form a hollow air space between themselves and the outer panel units. Fig. 15 is an elevation of an aggregate panel unit showing the construction of an interior partition or interior wall as commonly occurs in corridor sides of office buildings, with door and glass openings. Fig. 16 is a horizontal section of the same. Fig. 17 is a vertical section of the same. Fig. 18 is a fragmentary section, enlarged, showing the junction of three partition panel units.

The letter A is used throughout to designate the panel which is the unit of my construction. This panel unit, as seen in Fig. 1, is composed of steel and concrete, and may be of any outline or contour to suit the position for which it is intended. I have herein illustrated it as a quadrilateral of rectangular outline. The steel component of the panel is a frame made up of steel bars 1, which form the border. These border bars are of flanged or angle-section. Their most common form is that of a T-section, and in Fig. 1 they are all of this section.

The border bars 1 are united at their angles by small angled-plates 2, and said border bars are further connected by steel rods 3 which may extend in every direction, here shown as being parallel and equidistant, and extending from side to side and end to end. The rods 3 may be connected in any suitable manner to the border bars. An effective connection is to hook them through holes in said border bars. For such connection, the shapes here shown lend themselves perfectly, in that the T-shapes are set with their stem flanges extending inward and receiving the hooked ends of the rods 3. Through any of the flanges of the border bars, according to the position in which the panel unit is to be employed, bolts 4 are inserted. The steel frame of the panel unit A being thus formed, is ready for the concrete 5. This is

applied by pouring or otherwise filling it in around the rods 3 and between the border bars, until the panel unit is of uniform thickness, and with an even or other shape of surface. All this work is best, though not necessarily done in the shop, the floor or platform surface upon which the panel unit is formed being purposely made to give the surface of the panel the required smooth and finished appearance, the upper edges of the border bars forming a guide for the straight edge with which the finished surface can be smoothed to any design required.

Passing now to Fig. 2, it will be seen that the panel unit A may be employed in floor construction. In this figure, two such panel units A are assembled side by side, their adjacent edges being separated to leave a space B, between them for conduits of plumbing, heating or wiring. Further, as shown in Fig. 3, wherein three floor panel units are shown, the panel units lie over a steel bar 6 of channel section, which gives a beam effect, and all said units are jointed over a steel frame support 7. The channel bar 6 is for reinforcement if necessary, or a built up beam of other material can be used instead. The conduits B can be formed in any direction, and in any number as may be desired for convenience or appearance. Also as shown in Fig. 4, two floor panel units may be assembled together with the base of a partition panel unit, all being jointed over a steel frame support 8. It may be noted that in these Figs. 2, 3 and 4, the T-shaped border bars are disposed with their stem flanges extending in the direction of the thickness of the panel unit.

Turning now to the construction of the outer walls, Figs. 5, 6, 7, 10 and 11 show how the panel units A may be directly combined to form what may be termed an aggregate panel unit, providing for surface openings C. In this case, the panel units A are made of varying shapes and sizes and are directly bolted together, the only variance in construction, in this case of the outer walls, being that the aggregate panel unit has for its base border-bar a steel bar 9 of Z-section instead of T-section, this being for the purpose of better weather protection of joinings when in place as is shown in Figs. 13 and 14. The surface openings C, when in exterior walls may receive any kind of ornamental treatment, or may be left plain to receive other work, any kind of frame, wood or metal, being applied.

In Figs. 8, 9 and 12, I show how two such aggregate panel-units of Figs. 5, 6 and 7, may be jointed edge to edge vertically. In this case a steel bar 10 of channel section is bolted to the adjacent border pieces of the panel units. The space D, thus left may be occupied by the column or support of a steel frame construction, or it may be fitted with

concrete and bars for a reinforced concrete column or support, or it may receive a wooden post in wooden frame construction. The channel bar 10 is adapted for ornamental pilaster treatment.

In Fig. 13 I show two exterior-wall panel units jointed one over the other, the Z-section 9 of the top unit being bolted to the T-section 1 of the lower unit. Short plates 11 are bolted to the Z-section 9 and to the flange of the T-section of a floor panel unit, at intervals to form ties or anchors to the floors.

In Fig. 14 I show a similar construction to that of Fig. 13, with the addition of two extra but thinner wall panel units back of the exterior wall units, to form an air space E for insulation or damp-proofing.

Passing now to partition and interior wall construction, the application of the panel units and their aggregate to such construction I show in Figs. 15, 16, 17 and 18. These panel-units may be so assembled as to leave openings such as F, or they may be solid if desired. Three partition panel units or their aggregates may be jointed together as shown in Fig. 18, the edges of the panels being bolted to a channel piece 12 or to the steel frame work. All edges will be completely connected and fastened as shown.

As shown in Figs. 4, 13 and 14, the flanges and stems of the border bars of the panel units of the floor, where they join partitions, form other conduits G, which may be filled in completely with cement, wood or other material or they may receive removable slabs of wood, tile, cement or other material. The entire floors, walls and partitions may be deafened or may receive the same kind of interior treatment as is used in other constructions. The partitions may be doubled to form hollow air spaces for insulation or for ducts or conduits. It is only necessary to apply the finishing coat of plaster on them, thereby saving the lathing and brown coats, or they can be left sand finished. The same is true of the exterior walls. The wall, partition and floor panel units can be provided with wooden nailing strips, as in other constructions, to nail moldings, wainscot base and other trim to them. An additional floor can be constructed under the top floor for insulation, damp-proofing, ducts or conduits, if so desired, by suspending the same from the top floor or supporting it on lower flanges of steel girders or in any other convenient method of construction.

The angles and corners produced by the junctures of the walls, partitions and floors may receive a pilaster treatment as shown at 13 in Figs. 12 and 18 or a beam effect as shown at 6 in Fig. 3. These can be formed or shaped to any desired design. The spaces thus formed may be used as conduits or ducts or they may be completely filled in

with cement, wood, or any other desirable material. The entire work here described is to form the complete outer and inner walls and floors of a building. The exterior surfaces need no further treatment. All can be shaped, molded and constructed to meet the requirements of the design and character of the building for which they are intended.

It will now be seen that by my invention I provide for a building construction which is simple and economical. The raw material may be assembled, shaped, and constructed complete at a place equipped for the purpose, and when the various parts or products are ready they may be transported to the site of the proposed building and there set up permanently in their proper positions. No temporary forms are required. The products are manufactured in a place sheltered from inclement weather, thereby insuring a better and safer construction.

My invention provides for obtaining molded, sculptured or other ornamental features, constructed and forming an integral part of the product. It provides also an easy means of testing the strength of the products. It lends itself to the provision of easy and accessible conduits or passage-ways for plumbing and gas pipes, heating and ventilating ducts, wiring for electric lights, power and telephone. It requires no scaffolding, no lathing, no furring for walls and partitions, and it saves two coats of plaster; nor need the exterior of the building be painted. There are no special forms required at the building, thereby saving expense. It saves loss or waste of useful materials, as these are in a sheltered place and need not be scattered on the premises of the building site. The cutting and fitting being done in a systematic manner prevent waste. Time is also saved, an important item in consideration of occupancy. Time, labor and material are saved in the mixing, handling, hauling and pouring of concrete. The concrete is in a better condition of strength as it is not subject to any strain of overloading while it is setting. It preserves the rods from being displaced or bent down, which is unavoidable in old methods where they are subjected to strain by craftsmen walking on them before the concrete is poured or properly set; nor is the concrete subject to injury by frost. By my invention, the supervision becomes more effective, as the work is more concentrated and is at all times in plain view of the superintendent.

It is often desirable to erect office or other buildings with partitions omitted, to suit possible requirements of tenants. My invention provides for these future partitions in a convenient and economical manner, as all the work may be done outside of the building and other tenants need not be in-

convenienced. This holds true also of alterations and additions.

In my construction no heavy steel girders or supports are required where there are long spans, as the panel units are self-supporting and lighter than the corresponding parts or members in old constructions. All the panel units may be anchored or tied together in such a manner as to form complete ties of the building throughout. My invention also provides a convenient and simple, economical means for the construction of bulkheads, retaining walls, roofs and sidewalks.

An important feature of the invention resides in the fact that each panel unit employing as it does a T-shaped border, forms a truss within itself and a complete self supporting construction which requires no further temporary or permanent supports outside of the structural frame work necessary for any building. The flange of the T serves as a guide for straight edging all of my panels. It replaces studding and forms a perfect frame for openings, such as windows, transoms, doors, etc., and the stem of the T lends itself for the ready application of the reinforcing rods.

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

1. In a building construction, a plurality of panel units, each unit embodying border bars of T-shaped section, members connecting the stem flanges of said bars, and a concrete filling enveloping said members, two of said panel units being arranged in the same plane and in such wise that the adjacent border planes of their bars are separated to leave a space between them, with other planes of said bars projecting toward each other to form a floor for said space, and a third of said panel units arranged in a plane perpendicular to that of the other two within the said space and resting on the floor thereof.

2. In a building construction, a plurality of panel units, each unit embodying border bars of T-shaped section, members connecting the stem flanges of said bars, and a concrete filling enveloping said members, said panel units being arranged in the same plane and in such wise that the border planes of the bars of adjoining panels are separated to leave a space between them, with other planes of said bars projecting across said space toward but terminating short of each other, and a channeled member underlying said projecting planes.

3. In a building construction, a plurality of panel units, each unit embodying border bars of T-shaped section, members connecting the stem flanges of said bars and a concrete filling enveloping said members, said panel units being arranged in the same

plane and in such wise that the border planes of the bars of adjoining panels are separated to leave an intervening space, and a member crossing said space and connecting the border bars.

4. In a building construction, a plurality of panel units, each unit embodying border bars of T-shaped section, members connecting the stem flanges of said bars and a concrete filling enveloping said members, two of said panel units being arranged in the same plane and in such wise that the border planes of the bars of adjoining panels are separated to leave an intervening space, a member crossing said space and connecting the border bars, and a third of said panel units arranged in a plane perpendicular to the plane of and entering between the other two units, and secured by its border bar to said crossing member.

5. In a building construction, a plurality of panel units, each unit containing border bars of T-shaped section, members connecting the stem flanges of said bars and a concrete filling enveloping said members, said panel units being arranged and connected together to form a plurality of separate panel-aggregates, and a bar of Z-shaped

section forming one border of one panel-aggregate and connecting adjacent edges of adjoining panel aggregates, the wings of said Z-shaped bar overlapping in opposite directions opposite sides of said aggregates.

6. In a building construction, a plurality of panel units, each unit containing border bars of T-shaped section, members connecting the stem flanges of said bars and a concrete filling enveloping said members, said panel units being arranged and connected together to form a plurality of separate panel-aggregates, a bar of Z-shaped section forming one border of one panel-aggregate and connecting adjacent edges of adjoining panel aggregates, the wings of said Z-shaped bar overlapping in opposite directions opposite sides of said aggregates, a plate secured to and projecting from said Z-shaped bar, and other panel aggregates secured by their border bars to said plate.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE W. HANSBROUGH.

Witnesses:

WM. F. BOOTH,
D. B. RICHARDS.