

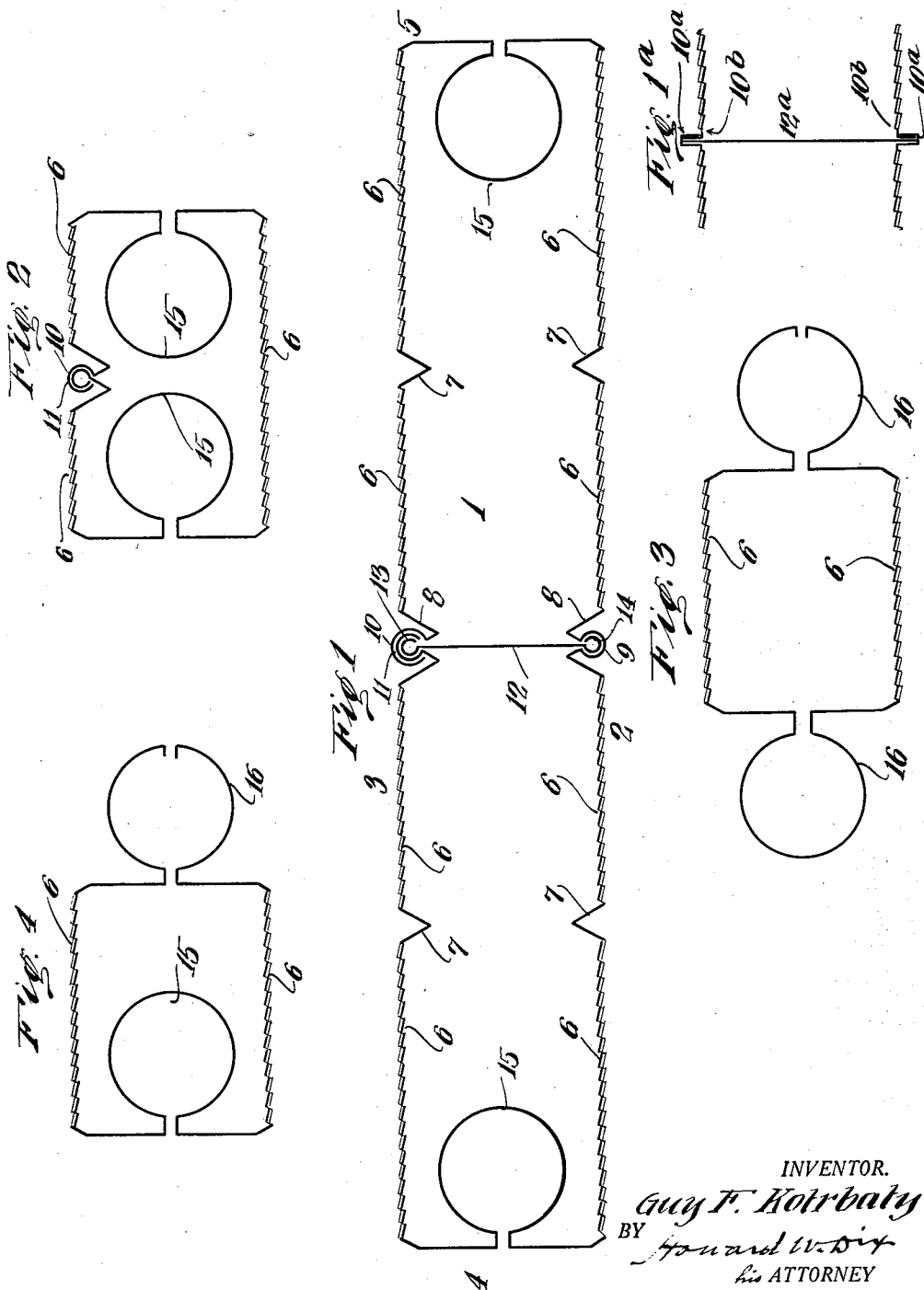
Sept. 20, 1932.

G. F. KOTRBATY
BUILDING CONSTRUCTION

1,877,898

Filed July 27, 1928

11 Sheets-Sheet 1



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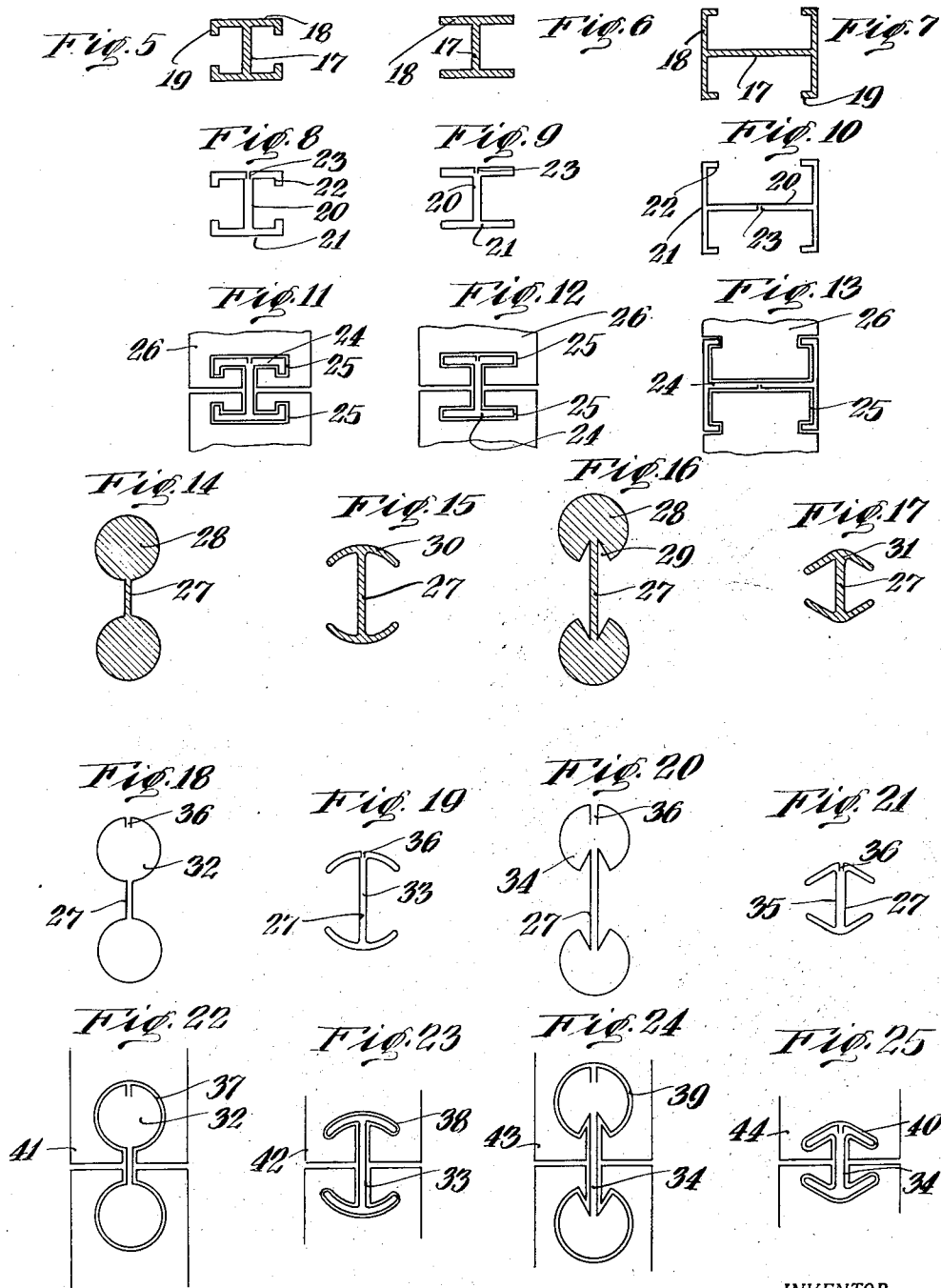
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11 Sheets-Sheet 2



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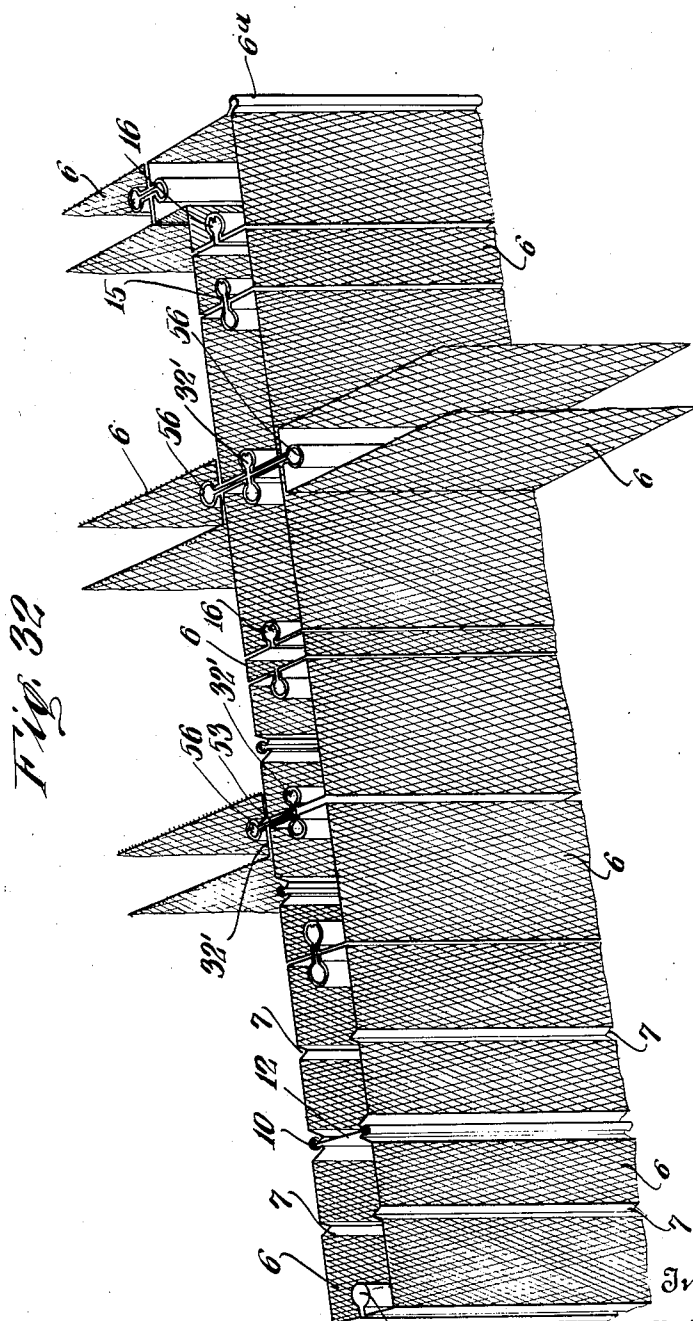
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BUILDING CONSTRUCTION

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11 Sheets-Sheet 4



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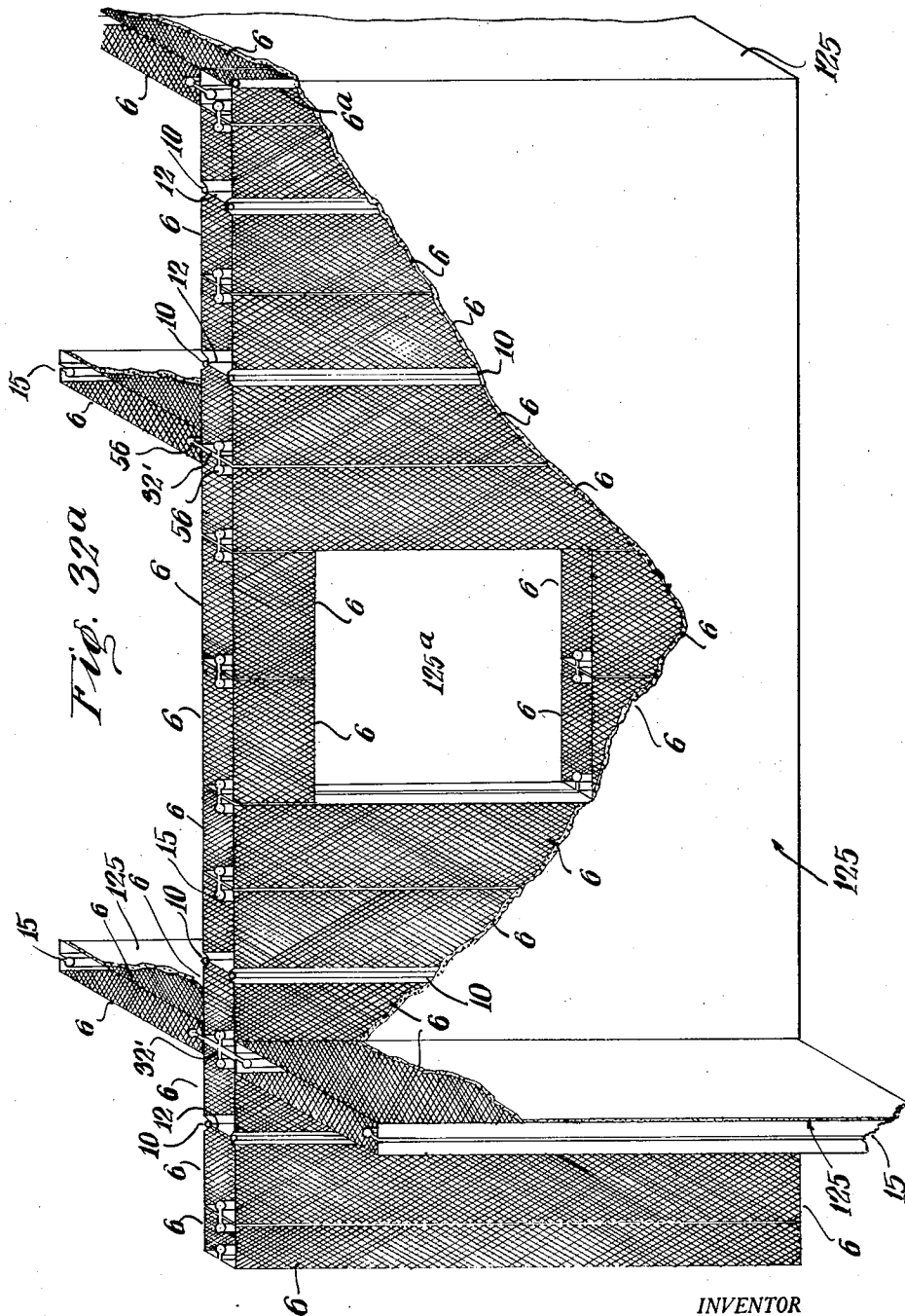
G. F. KOTRBATY

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BUILDING CONSTRUCTION

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11 Sheets-Sheet 5



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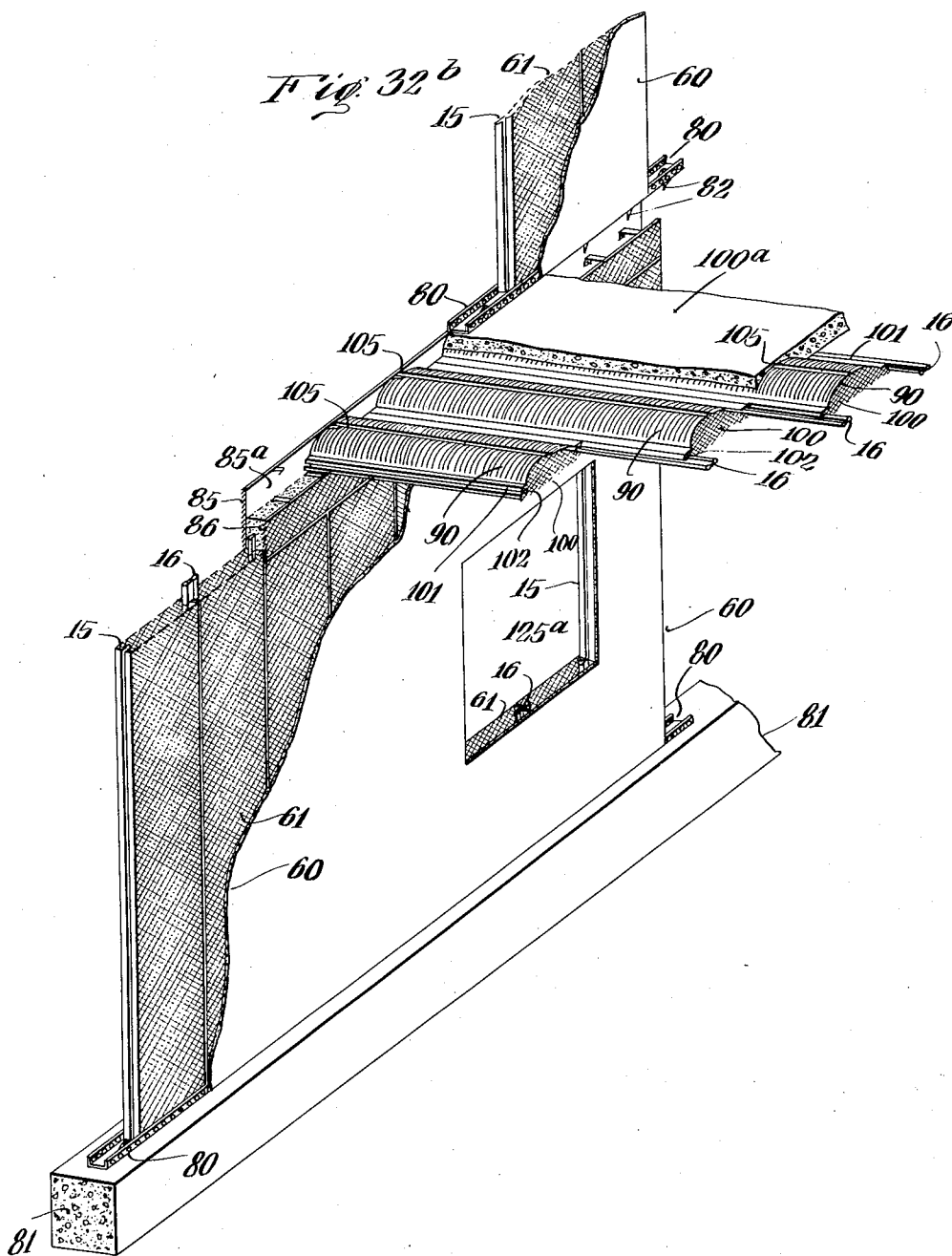
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BUILDING CONSTRUCTION

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11 Sheets-Sheet 6



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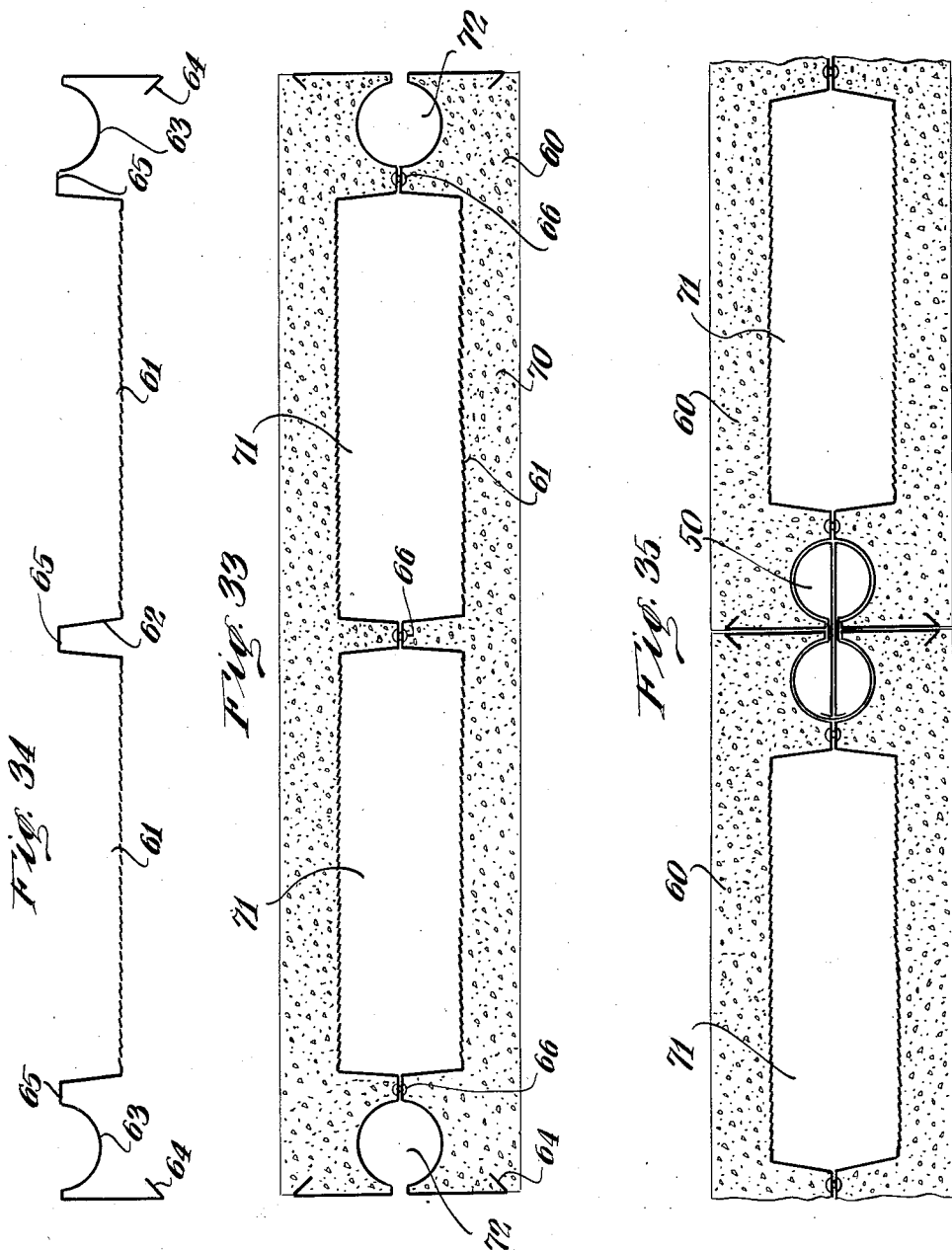
G. F. KOTRBATY

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BUILDING CONSTRUCTION

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11 Sheets-Sheet 7



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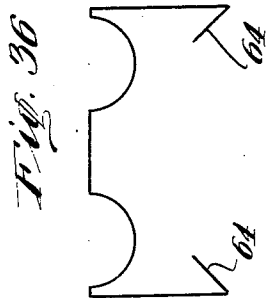
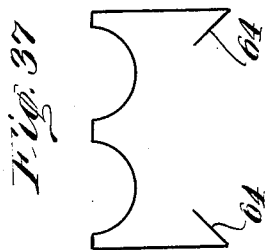
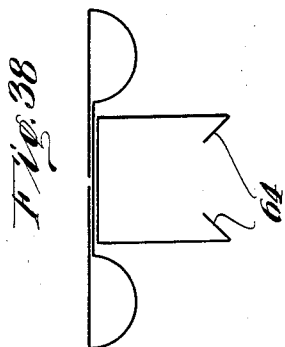
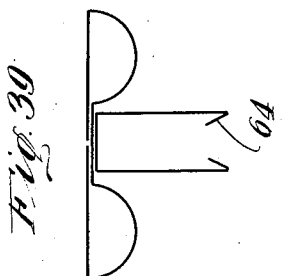
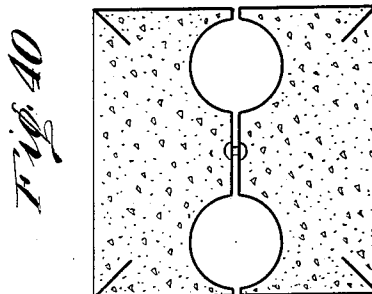
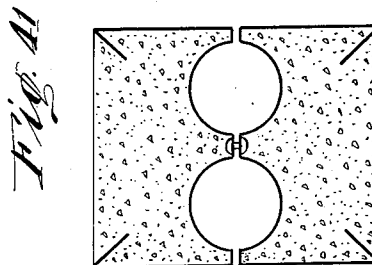
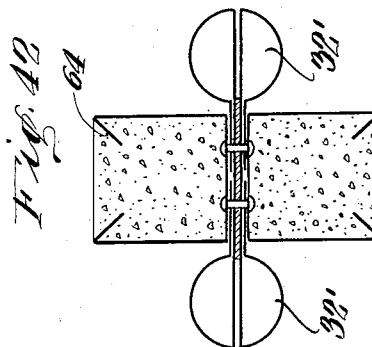
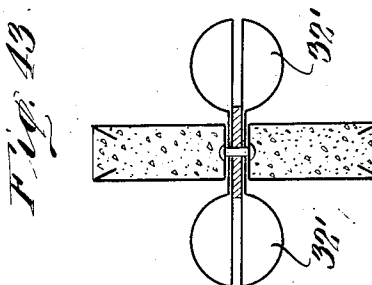
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BUILDING CONSTRUCTION

Filed July 27, 1928

11 Sheets-Sheet 8



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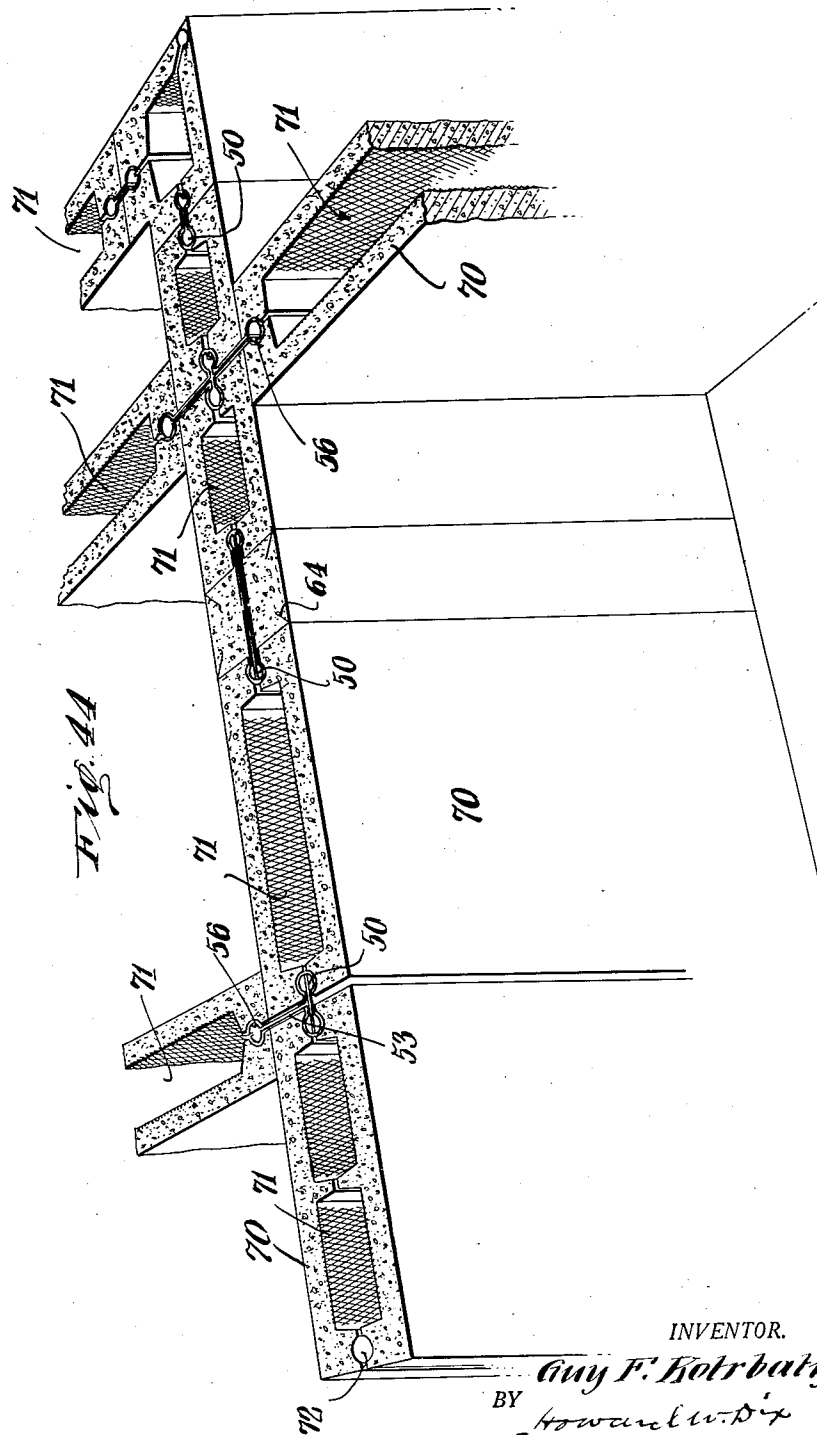
G. F. KOTRBATY

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BUILDING CONSTRUCTION

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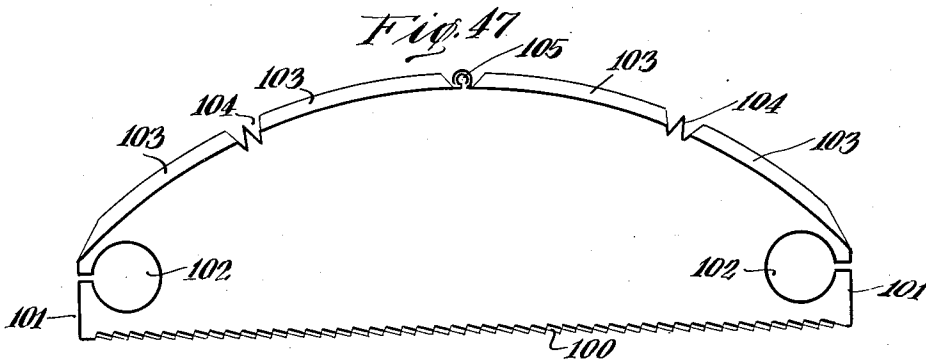
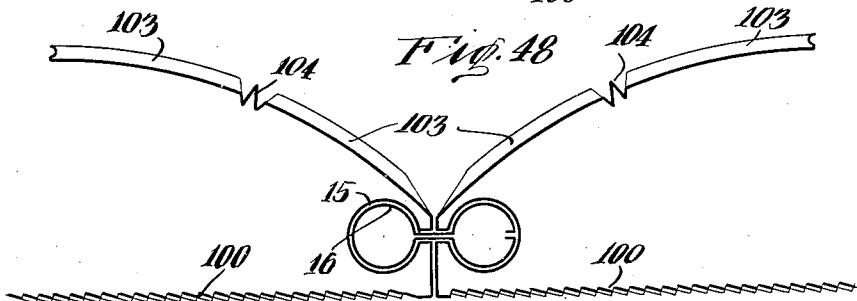
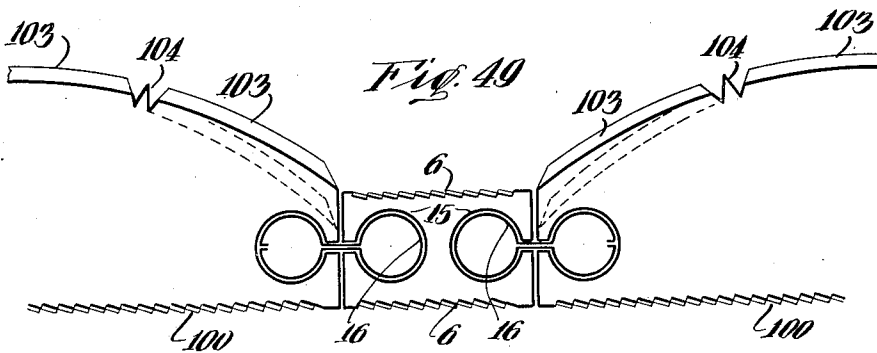
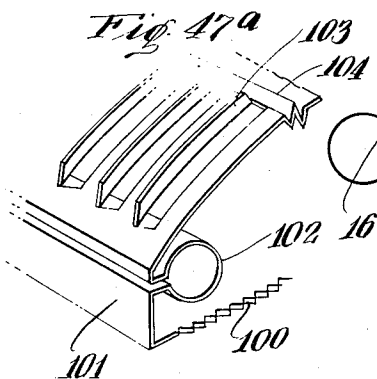
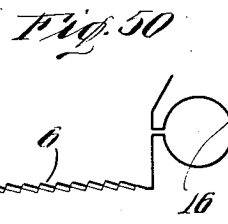
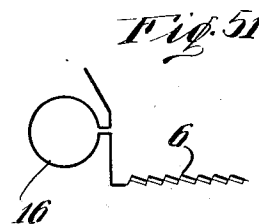
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G. F. KOTRBATY
BUILDING CONSTRUCTION

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11 Sheets-Sheet 10



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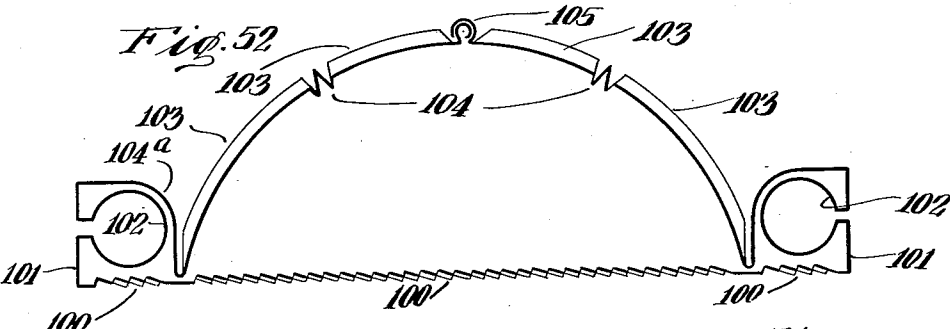
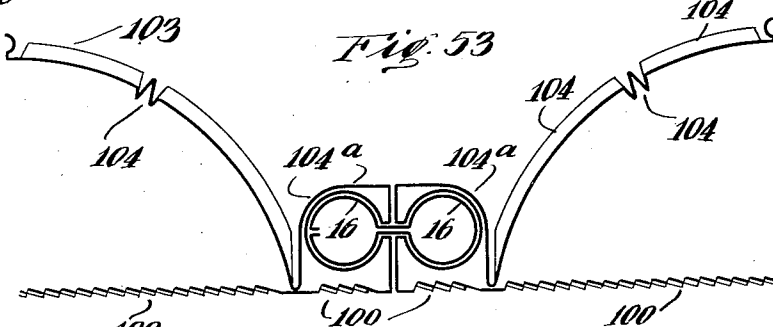
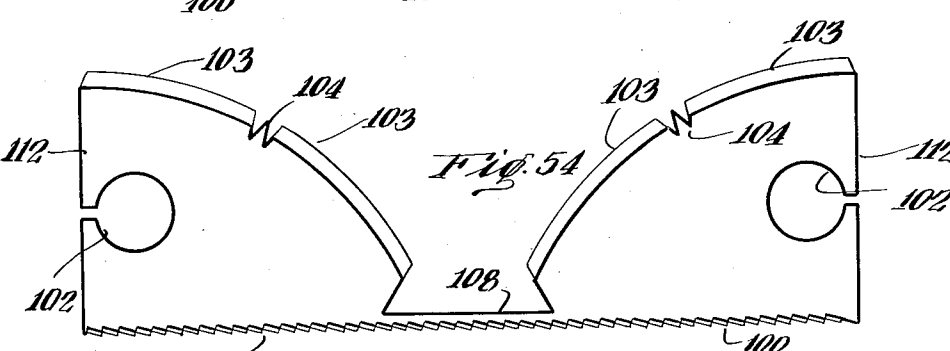
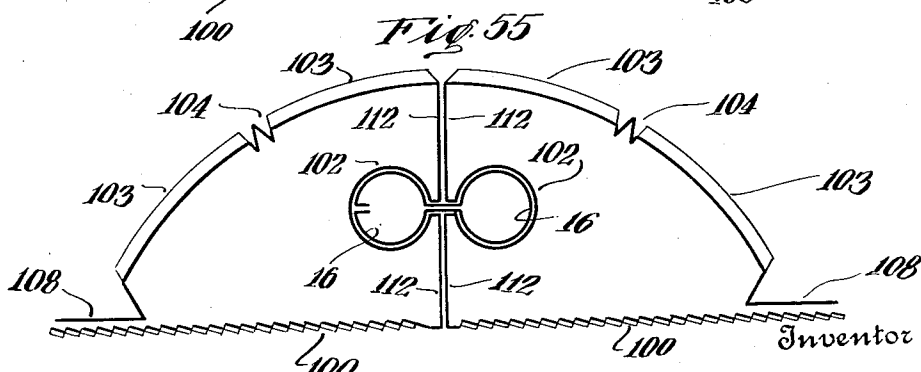
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G. F. KOTRBATY
BUILDING CONSTRUCTION

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11 Sheets-Sheet 11



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UNITED STATES PATENT OFFICE

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BUILDING CONSTRUCTION

Application filed July 27, 1928. Serial No. 295,705.

This invention relates to the construction of sheet steel members adapted for use in building construction and more particularly to an improved design of such members designed for the erection and construction of all kinds of houses and buildings and especially for facing and dividing walls.

It is an object of this invention to provide an expanded steel construction unit provided with stiffening ribs and integral keyways and the invention also comprehends a novel design of key members to cooperate with the keyways.

Yet another object of this invention is the provision of such construction units provided with improved keyways and key members, the whole being so constructed and arranged as to give at one and the same time a substantial and safe construction of relatively light weight which is particularly useful in constructing buildings of any height, and which units are easily handled.

A further object of this invention is the provision of a building material which is cheap in cost, requires relatively unskilled labor for assembling the units into a finished structure, thereby permitting marked economies in building construction.

Another object of this invention is the provision of a new form of building construction unit fabricated from expanded sheet steel members to form a unitary double walled member of great strength and minimum weight.

A further object of this invention is the provision of a pre-cast monolithic building member comprising the integral sheet metal unit to be hereinafter described.

These and other desirable objects of the present invention will be set forth and described in the accompanying specification and illustrated in the drawings, it being understood, that the examples shown are given merely by way of example, for since the underlying principles may be incorporated in other specific structures it is not intended to limit the constructions to the forms shown except as such limitations are clearly imposed by the appended claims.

In the drawings like numerals refer to sim-

ilar parts throughout the several views of which

Fig. 1 is a horizontal section of a construction unit;

Fig. 1a is a horizontal section of the middle portion of a construction unit showing an alternative form of securing means for the unit sections;

Fig. 2 is a horizontal section of a small construction unit provided with keyways and adapted for insertion as a filling member between larger construction units;

Fig. 3 is a view similar to Fig. 2, the unit being provided with a plurality of key members in place of keyways;

Fig. 4 is a horizontal section of a unit embodying the features of the construction shown in Fig. 2 and Fig. 3, this member being provided with a keyway and a key member;

Figs. 5, 6, and 7 are horizontal sections of solid H-shaped key members; Figs. 8, 9 and 10 are views similar to Figs. 5, 6 and 7, the members being rolled from sheet material;

Figs. 11, 12 and 13 are horizontal sections of the members shown in Figs. 5 to 10 in position in their respective keyways;

Figs. 14 to 17 are horizontal views of other types of solid keys and Figs. 18 to 21 are horizontal views of keys similar to those shown in Figs. 14 to 17, the members being made from sheet metal;

Figs. 22 to 25 are horizontal sections of Figs. 14 to 21 in position in their respective keyways;

Figs. 26 and 27 are modified forms of the key members shown in Figs. 18 and 20;

Figs. 28 and 29 are horizontal cross sections of key members provided with integral panel members;

Figs. 30 and 31 are sections of key members adapted to lock a plurality of wall members in angular relation to one another;

Fig. 32 is a view partly in section and partly in elevation of a plurality of construction members keyed together to form the partition walls of several rooms;

Fig. 32a is a view similar to Fig. 32 show-

ing a coat of plastic material applied to the surfaces of the construction members;

Fig. 32b is a view, partly in section and partly in elevation, of a plurality of construction members assembled and keyed together to form wall and floor sections, a coating of plastic material being applied to the members to form the surface finish;

Fig. 33 is a horizontal cross section of a precast member;

Fig. 34 is a section of a core used in Fig. 33;

Fig. 35 is a horizontal section showing the method of joining a plurality of the units shown in Fig. 33;

Figs. 36 to 39 are horizontal sections of a number of units for forming connecting members;

Figs. 40, 41, 42 and 43 are horizontal cross sections of pre-cast connecting units utilizing the members shown in Figs. 36 to 39 respectively;

Fig. 44 is a view similar to Fig. 32, and shows a plurality of pre-cast units assembled in a completed structure;

Fig. 45 is a detail vertical section of the means for anchoring the wall members shown in Fig. 44 in position;

Fig. 46 is a view in elevation of a channel member adapted to receive the wall member;

Fig. 47 is a vertical section through a floor member;

Fig. 47a is a fragmentary vertical section, partly in elevation of a floor member as shown in Fig 47, showing the slotted ribs and longitudinal stiffening members;

Fig. 48 is a detail vertical section showing the method of uniting a plurality of floor members;

Fig. 49 is a vertical section of a modification of structure shown in Fig. 48;

Figs. 50 and 51 are detailed vertical sections of key members used in conjunction with the floor members;

Figs. 52 to 55 are modifications of the structure shown in Figs. 47 to 49.

Referring now to Fig. 1, the construction unit or wall member designated generally by the numeral 1 comprises parallel wall portions 2 and 3, together with integral end portions, 4 and 5. The side portions comprise a plurality of expanded sections, 6, provided with re-entrant stiffening ribs, 7. At its center portion the unit is provided with a vertical stiffening member, 8, and a beaded portion, 9. Opposite the member 9, the ends of the sheet metal unit are provided with locking beads, 10 and 11, which are rolled together or crimped in any suitable fashion. A stiffening member 12, of sheet metal provided with beaded end sections, 13 and 14, is inserted in the key-ways formed by the beaded portions, 9, 10-11, and may be crimped thereto in any desired manner.

While the side walls are preferably made to include expanded sections with integral

alternate stiffening ribs, the invention comprehends the use of fluted or corrugated sections in their stead, the said sections being formed of solid sheet metal of any desired size and composition.

As shown in Fig. 1a, the unit may be joined at their center sections by a stiffening member 12a cooperating with flanges 10a and 10b of separate sections of the unit, the flanges and the stiffening member being crimped together in the well known manner or pressed together, as desired. While the sections are shown as being mechanically secured together by pressing or rolling, they may be integrally secured by seam welding of various types, such as resistance welding or oxy-acetylene welding. Any other method of autogenously joining the sections is comprehended in the basic idea of this invention, and where the question of strength is not of paramount importance, the sections may be brazed or soldered together.

As shown in Fig. 1, the wall member is provided with key-ways, designated generally by the numeral 15, adapted to receive key members to be described more in detail hereinafter. In place of the key-ways shown in Figs. 1 and 2 the member shown in Fig. 3 is provided with a plurality of key members, 16, and the unit shown in Fig. 4 is formed with both a key-way and a key member.

Figs. 5 to 7 show several types of solid key members having the general configuration of an I-beam. These solid members comprise web portions, 17, with integral end or side faces, 18. If desired these faces may be provided with flanged portion, 19, as shown more particularly in Figs. 5 and 7. While this construction gives a desirable strength and rigidity in the key member and imparts a sufficient structural strength when used in key-ways novel results are secured by forming such members of sheet metal as shown in Figs. 8 to 10. In these figures the key members comprise web portions, 20, and end portions, 21, flanged or not, as desired, at 22. The ends of the sheets from which these members are rolled or otherwise suitably formed are juxtaposed as at 23 to form reentrant portions. These adjoining flange portions of sheet metal may be welded or brazed together, if desired, to secure added stiffness in the member. Comparing these members with solid members of like configuration it will be noted that for all practical purposes a maximum of strength is provided while securing a distinct saving in metal as well as marked economies in fabrication.

In use the I-shaped key members, designated hereinafter for convenience generally by the numeral 24, are fitted into appropriate key-ways, 25, in construction units 26, as will appear more in detail hereinafter.

In Figs. 14 to 18 are disclosed a plurality of key members rolled or otherwise formed

from solid metal. In Fig. 14 there is shown a key member having a web portion, 27, and symmetrical cylindrical portions, 28. The cylindrical portions may be provided with cut-out portions 29, as shown in Fig. 16 to insure an improved locking of the several members.

In Figs. 15 and 17 there are shown key members comprising web portions, 27, and integral arcuate end portions, 30, 31, the particular configuration being a matter of choice with the architect or designer.

In Figs. 18 to 21, there are shown a plurality of key members corresponding generally to those shown in Figs. 14 to 17, but being formed from rolled sheet metal. For convenience of description these are designated generally by the numerals 32, 33, 34 and 35. As noted in the description of Figs. 8 to 10, these members may be joined together by welding or brazing at 36, instead of having the reentrant end portions separated or disconnected. In Figs. 22 to 25 the key members of Figs. 18 to 21 are shown in engagement with appropriate key-ways, 37, 38, 39 and 40, in construction units 41, 42, 43 and 44.

Wherein increased stiffness and strength in a key member is desired without resorting to a cast or rolled solid member the constructions shown in Figs. 26 and 27 are made use of. It will be noted that the structure shown in Fig. 26 comprises a substantially double walled member having inner and outer walls 45, 46, respectively, which construction assures a maximum strength and resilience while retaining the advantages of light weight. Fig. 27 shows a key member having the usual web portion, 27, together with cylindrical end portions 47 and 48, the metal forming the portion 48 being bent inwardly to form parallel reinforcing members, 49, 50, terminating adjacent the inner surface of portion 47, in curvilinear flanged portions, 51 and 52. The structures shown in Figs. 26 and 27 can be readily fabricated from sheet metal and impart considerable strength without involving any substantial increase in weight of metal.

It will, of course, be appreciated that the key members will be made from suitable weight stock in order to provide the necessary reinforcement to adapt them to support the various floor loads met with in different constructions. While the keys may be fabricated from the same weight stock as is used for the grid members, it is preferred to use a thicker stock in order to assure an ample factor of safety in the finished assembly.

The key members are so constituted and arranged as to provide a substantially watertight seal between the faces of the finished grid faces or walls of the pre-cast monoliths. This is accomplished by the uniform bearing of the key surfaces against the corre-

sponding keyways, both surfaces being co-extensive throughout their entire extent, and the web portions forming a solid metallic barrier through the grid ends, the whole forming an efficient seal against the passage of fluids.

The key members hereinbefore discussed are intended primarily for use in connecting straight sections of the construction units shown particularly in Fig. 1. Where it is desired to permit the attachment of interior finishes and the like at the junction of a pair of construction units, this invention comprehends the use of key members provided with unilateral extensions, 53, or bilateral extensions, 54, provided on one or both sides of the web member and being furnished with hollow panel members, designated generally by the numeral 55. These panel members may be given any suitable configuration to accord with the finish desired.

Where wall partitions are to be abutted or built out from a main wall the key members shown in Figs. 30 and 31 are used. These comprise the usual cylindrical portions designated generally by the numeral 32' and lateral cylindrical portions, 56. While the keys have been spoken of as having cylindrical portions, 56, it will of course be understood that any suitable configuration may be imparted thereto without departing from the spirit and scope of the present invention.

Referring now to Fig. 32, there is shown an assembly of the various units above described, together with the appropriate key members in their optimum cooperative relationship. The simplicity of the construction as well as the rigidity of the separate integral members is readily apparent. These members are set up in appropriate channel sections as will be described more in detail hereinafter, and when in position may be coated with stucco or plaster 125, to give a finished structure, as shown more particularly in Fig. 32a. Where a corner section is encountered, a corner protective and stiffening bead 6a, which is formed integral with two angularly disposed side sections 6, is provided. This stiffening member adds a desired rigidity to the corner of the assembly and protects the plastic coat from mechanical injury. As shown more particularly in Fig. 32a, the stiffening member projects diagonally at the corner beyond the side walls of the grid members and provides a metallic key for the ends of the plastic coat, thus assuring its retention on the grid structure and protecting it from mechanical injury, as already noted. The grid members may be made in various lengths and widths to permit the formation of the necessary embrasures to accommodate the requisite doors and windows, as indicated generally at 125a in

Figs. 32a and 32b. This construction is particularly adapted for use in setting up partitions or curtains and the walls in offices where the wall members are not required to have any substantial strength, or it may be used for the construction of garages, bungalows and other structures involving heavy load-bearing walls. For cheap construction of garages and similar buildings, where a plastic outer coating is not necessary, the units may be made up with the side walls corrugated instead of being provided with alternate foraminous and solid sections, or the outer wall may be corrugated solid metal and the inner wall of expanded or foraminous metal adapted to receive a plastic coating. It will, of course, be understood that the conditions may be reversed, if desired to conform to any given specification or to harmonize with the surroundings. The simplicity of assemblage permits the building of such completed structures in a minimum of time and further permits the use of relatively unskilled labor, the requisite units being preformed and appropriately marked with the respective type numbers before being shipped to the site upon which they are to be erected. The types of the various units are so constituted and arranged as to provide any desired number of parts for use in building construction generally, while retaining the marked advantages of adapting itself to any design, thereby permitting a desirable elasticity in design features.

While there has been shown a preferred embodiment of the invention, it will of course be understood that other specific structures may be comprehended within the scope of this invention without departing from the spirit of the disclosure herein made.

Where the building units cannot be conveniently finished in their assembled state, the invention also comprehends the provision of pre-formed slabs or construction units embodying the principles hereinbefore described. Referring now to Fig. 33 there is shown a pre-formed unit designated generally by the numeral 60, comprising a plurality of grid members having grid portions 61, channel portions 62, interposed between the grid portions and integral therewith, and key forming recessed portions, 63, formed on either end and provided with reentrant angular portions, 64, for purposes to be described more in detail. To form the member 60, a pair of the grid forms are suitably secured at points 65, by suitable means such as rivets 66, it being understood that the grid sections may be welded or brazed together if desired. The completed grid structure is inserted in an appropriate form and a plastic mass of concrete cement, lime-mortar, gypsum or other appropriate construction material is poured around the core. The resulting structure comprises a monolithic

structure, 70, having grid core members 61, hollow interior spaces, 71, and keyways, 72. The expanded portions 61, and the anchor members 64, serve to retain the structural material in intimate contact with the metallic core and assure the monolithic structure above noted.

These monolithic members may be assembled in any desired fashion as shown in Fig. 35, the key members being substantially the same as those already set forth. Where it is desired to make a completely monolithic structure, concrete or other material may be poured into the hollow portions and around the keys, 50, thereby providing a continuous monolith.

In Figs. 36 to 39 inclusive, there are shown a plurality of core members for use in forming pre-cast inserts of the types shown in Figs. 40 to 43 respectively. These members are joined together as described in the discussion of the members shown in Figs. 33 and 34. Figs. 36 and 37 show core members adapted for association to form the double keyways shown in Figs. 40 and 41. The key members shown in Figs. 42 and 43 are made by securing the parts shown in Figs. 38 and 39 together by means of bolts or tack-welds as desired and subsequently casting the monolith around the cores, the keys 32' being substantially identical with those shown in Figs. 30 and 31, and subserving the same purpose.

In Fig. 44 there is shown a perspective view of a completed wall structure together with abutting side walls made up from the pre-cast units described, the several elements being clearly shown in their cooperative relationship.

In assembling the completed units shown in Figs. 32, 32a and 44 the wall members are fitted into channel members, 80 set in concrete supports 81. These members 80 are provided with fluted depending tongues 82, adapted to anchor in the concrete or brick courses, where brick is used. The channel members are of suitable size to receive the wall members whether of the form shown in Fig. 32 or pre-cast as shown in Fig. 45.

As shown in Figs. 45 and 32b a completed structure comprises a space or support 81, in which is embedded a channel retaining member 80. Fitted into the channel is a wall member 60, which in turn is capped by a member 83, provided with a channel portion, 84, to receive the top of member 60, the outer surfaces 85 and 86, being expanded or perforated to receive any desired finish.

Member 85 is backed by an integral, unexpanded metal skirt 85a adapted to contact with the solid plastic mass 83, and to prevent moisture from reaching the mass by conduction or capillary action from the outside stucco coat on member 85. This construction renders the joints of the building substan-

tially water-proof, which feature is also found in the pre-cast slabs shown in Fig. 33, where the grid sections are joined by securing means already described, the solid unexpanded portions 65 preventing the transfer of moisture from one face to the other due to their impermeability.

Superposed upon the members 83, are floor members 90, upon which, in turn, further pedestals or supports 81 may be placed.

The flooring 100a for the completed structures is built over a flooring member as shown in Fig. 47. This member comprises a bottom expanded or perforated grid portion 100 adapted to serve as a ceiling, integral end portions 101 provided with reentrant cylindrical portions 102, adapted to serve as keyways for the key members disclosed in Figs. 18, 20, 26 and 27. The member shown in Figs. 47 and 47a is provided further with an integral arch portion comprising horizontal slotted rib portions 103, and longitudinal stiffening members 104, traversing the members 103, at right angles as shown. The ends of the sheet metal structure are joined at the crown in any suitable manner as shown at 105. It will thus be seen that a flooring member has been provided which is so designed as to have a maximum compression resistance together with an under surface adapted to receive a finishing coating of stucco or plaster. These members are adapted to be juxtaposed in any desired number and locked together as shown in Figs. 48, 49, 53 and 55 by the key members previously disclosed. When the members are properly assembled, concrete or other monolithic structural material is cast over them to a suitable depth, the result being a monolithic structure having a maximum of strength, yet comprising a minimum of a metallic support together with a minimum amount of the concrete or other material.

In Figs. 50 and 51 are shown cores adapted to join the flooring members by serving as keys which can be filled with concrete or other structural material and thereby made integral with the floor in general, thus permitting the use of deeper concrete beam sections, providing added strength for heavier floor loads.

In Figs. 52—53 and 54—55 there are shown various modifications of the flooring support. The member shown in Fig. 52 is provided with reentrant arcuate portions 104a surrounding the keyways. This construction permits the more perfect arching of the structure adapting it to a heavier floor construction system by shortening the arch span and increasing the concrete beam section width as well as introducing a greater amount of steel for reinforcing purposes. In addition it is to be noted that the combination of the abutting keyways of this modification introduces an additional arch in the bottom por-

tion of the beam section, thus providing additional structural strength.

For bridge flooring or other heavy live load requirements, the structure shown in Figs. 54 and 55 is comparable to that just described. The characteristic feature of this construction is the combination of a centrally supported arch, locked by the key system already described, with an integral, keystone-shaped beam section. This results in a deeper beam section, as the bottom of the beam 108 is positioned substantially adjacent to the ceiling grid 100. The keyways are formed as reentrant portions of the vertical stiffening members 112.

The construction units herein described are readily formed from sheet metal of any suitable gauge and can be rolled or otherwise fabricated with a minimum of trouble and expense. In assembling, the units can be put together by unskilled labor, the parts being so formed and so constituted as to preclude any misplacement of the several units. The only skilled labor required in constructing a house, garage or other structure is that of the plasterer for applying the finish coating of stucco or other material to the grid members. While the ordinary coating materials have been described it will be readily understood that gunite or other plastic or cement mixes may be applied in any desired manner. Where the pre-cast monolithic units are used, the necessity for skilled labor is reduced to an absolute minimum while at the same time assuring optimum results both in speed of construction as well as in durability of the finished edifice.

What is claimed is:

1. A self-contained and self-supporting closed structural unit comprising front and back walls of foraminous metallic material and end walls of solid metallic material, said end walls being formed with integral reentrant keyways forming vertical supporting members.

2. A self-contained and self-supporting closed structural unit comprising front and back walls of foraminous material having reentrant vertical sections of solid metallic material, and end walls of solid metallic material, said end walls being formed with integral keyways forming vertical supporting members.

3. A structural unit comprising a plurality of aligned closed rectangular sections, said sections including integral foraminous and solid portions, certain of said solid portions being formed to provide keyways, a metal key member engaging said keyways and adapted to lock the rectangular sections in aligned relationship.

4. A building structure comprising a plurality of angularly disposed, closed rectangular units, each unit including integral foraminous and solid portions, certain of said

solid portions being formed to provide keyways; a metal key member fitting in the keyway of each unit and locking the units in said angularly disposed position.

- 5 5. A building structure comprising a plurality of angularly disposed, closed rectangular units, each unit including integral foraminous and solid portions, certain of said solid portions being formed to provide keyways; a metal key member fitting in the keyway of each unit and locking the units in said angularly disposed position; and a coating of plastic material on the exterior faces of said units, (said plastic coating being held in locking relationship by the foraminous portions of the said units).

- 20 6. A building structure comprising a plurality of aligned closed rectangular units, each of said units including integral foraminous and solid sections, certain of said solid sections being formed as reentrant portions disposed at the sides of said units, and certain other of said solid portions being displaced to form keys at the ends of said units, unit, and a metallic key member fitting in the keyway of each unit and retaining the units locked in aligned position.

- 30 7. A building structure comprising a plurality of aligned closed rectangular units, each of said units including integral foraminous and solid sections, certain of said solid sections being formed as reentrant portions disposed at the sides of said units, and certain other of said solid portions being displaced to form keys at the ends of said units, a metallic key member fitting in the keyway of each unit and retaining the units locked in aligned position, and a coating of plastic material on the exterior faces of said units.

- 40 8. A building structure comprising a plurality of closed angularly disposed building units, each unit including foraminous side and solid integral metallic end sections keyways formed in the end sections, and a metallic key member fitting in the keyways and locking the units in angular position.

- 50 9. A building structure comprising a cementitious base, an apertured metallic channel member supported in said base and having an integral section embedded in said base, a building unit fitting within said channel member, said unit including a metallic foraminous core, an air-chamber formed by said core; a securing member passing through said channel member and core; a cementitious coating disposed on both exterior faces of said building unit, the air-chamber and the securing member being so constituted and arranged as to provide a moisture-proof barrier between the faces of said building unit.

- 60 10. A monolithic building structure, including, in combination, cementitious base portions, apertured metallic channel members supported in said bases and having in-

tegral sections embedded in said base; abutted wall units having integral keyways fitted within said channel members, said units including metallic foraminous cores; securing members passing through said keyways and said channel members; cap members disposed on said wall units; combined floor and ceiling supporting units having arcuate floor sections and flat ceiling sections together with laterally disposed keyways supported on said cap members and secured thereto; keys positioned in said floor unit keyways whereby to lock the floor-ceiling units together; a cementitious coating on said wall, ceiling and floor sections, said sections serving at their point of contact as supports for further like constructions.

11. A building structure comprising a cementitious base, an apertured sustaining member supported in and affixed to the base and having an integral section embedded in said base, a building unit fitting within said member, said unit including a metallic foraminous core, an air chamber formed by said core; a cementitious coating disposed on both exterior faces of said building unit, the air chamber and securing member being so constituted and arranged as to provide a moisture-proof barrier between the faces of said building unit.

12. A building structure comprising a cementitious base, an apertured sustaining member affixed to the base, a plurality of building units fitting within said member, each of said units including a metallic foraminous core and an air chamber formed by said core, and a securing member disposed in interlocking relationship to the building units to form a joint between contiguous units; a cementitious coating disposed on both exterior faces of said units, the air chamber and securing member being so disposed as to provide a moisture-proof barrier between the faces of said building units.

13. A monolithic building structure, including, in combination, cementitious base portions and apertured sustaining members supported in said base portions and having sections affixed to the base; abutted wall units having integral keyways fitted within said sustaining member, said units including metallic foraminous cores; securing members passing through said keyways and said channel members; cap members disposed on the wall units; combined floor and ceiling supporting units having arcuate floor sections and flat ceiling sections together with laterally disposed keyways supported on said cap members and secured thereto; keys positioned in said floor keyways adapted to lock floor-ceiling units together, and a cementitious coating on said wall, ceiling and floor sections, said sections serving, at their points of contact, as supports for further like constructions.

14. A monolithic building structure, including, in combination, cementitious base portions, an apertured sustaining member supported in said base portions, and having sections affixed to the base; abutted wall units having integral keyways fitted within said sustaining member, said units including metallic foraminous cores; securing members passing through said keyways and said channel members; cap members disposed on the wall units; combined floor and ceiling supporting units having arcuate floor sections and flat ceiling sections together with laterally disposed keyways supported on said cap members and secured thereto; keys positioned in said floor unit keyways adapted to lock floor-ceiling units together and to take at least a portion of the imposed stress.

15. A building structure comprising a plurality of angularly disposed closed building units, each unit being a self-supporting box-like member having an open top and bottom and including alternate foraminous and integral solid sheet metal end sections, keyways formed in the end sections, a metallic key member fitting in the keyways and locking the units in angular positions, and a coating of plastic material on the exterior faces of said units.

16. A building structure comprising a cementitious base, an apertured metallic channel member supported in said base, and having an integral section embedded in said base, an open ended rigid and self-supporting closed building unit fitting within said channel member, said unit comprising a metallic foraminous core having solid ends including keyways for engaging securing members, and a securing member passing through said channel member and core ends.

In witness whereof I affix my signature.

GUY F. KOTRBATY.