Feb. 15, 1938. G. F. KOTRBATY 2,108,065

BUILDING CONSTRUCTION AND STRUCTURAL ELEMENT THEREFOR

Filed April 5, 1935 6 Sheets-Sheet 1

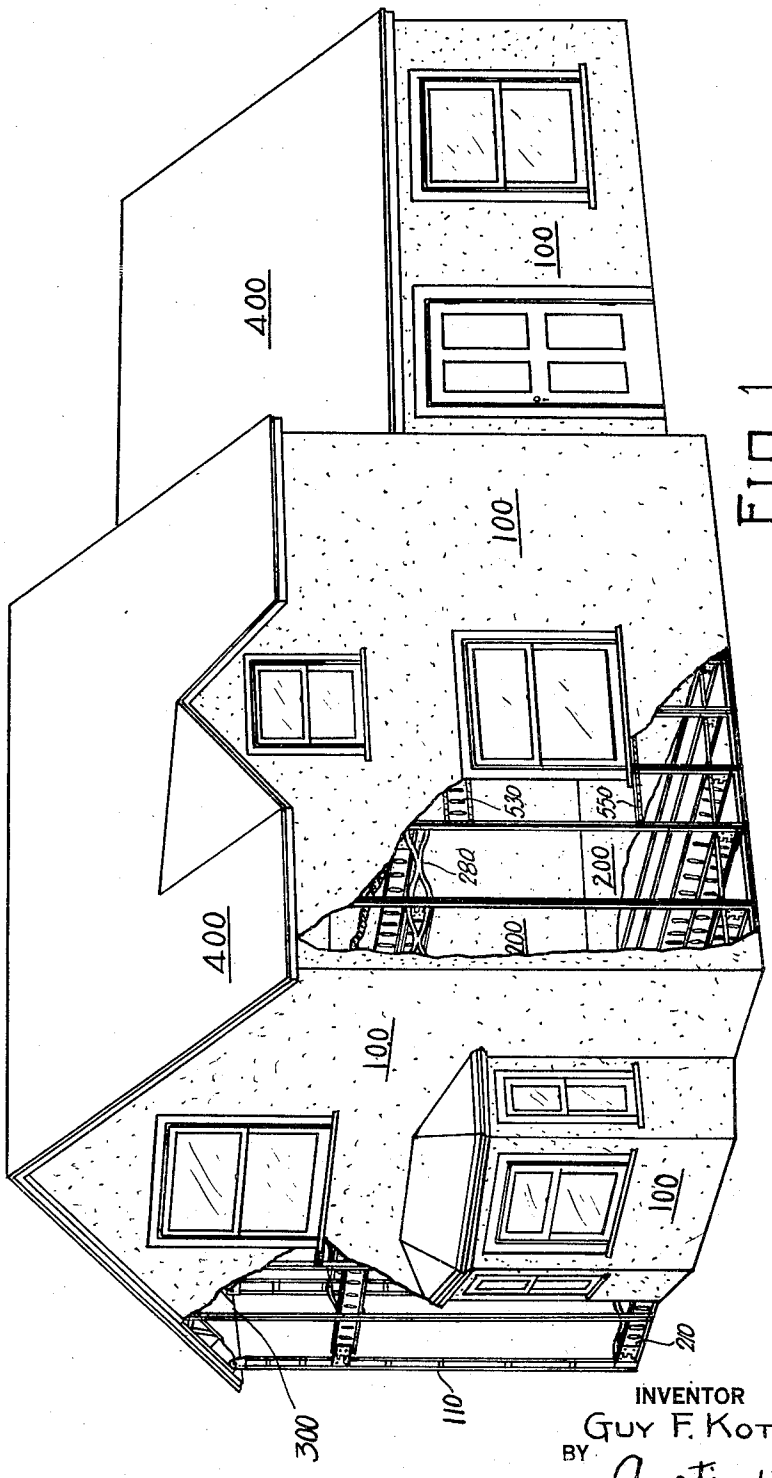


Fig. 1

INVENTOR
GUY F. KOTRBATY
BY
Austin + Dix
ATTORNEY

Feb. 15, 1938. G. F. KOTRBATY 2,108,065

BUILDING CONSTRUCTION AND STRUCTURAL ELEMENT THEREFOR

Filed April 5, 1935 6 Sheets-Sheet 2

Fig. 2.

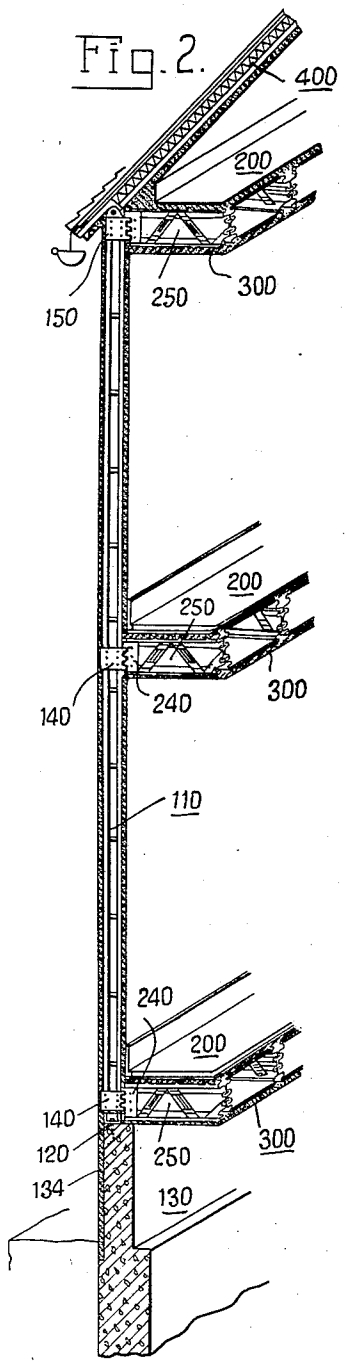
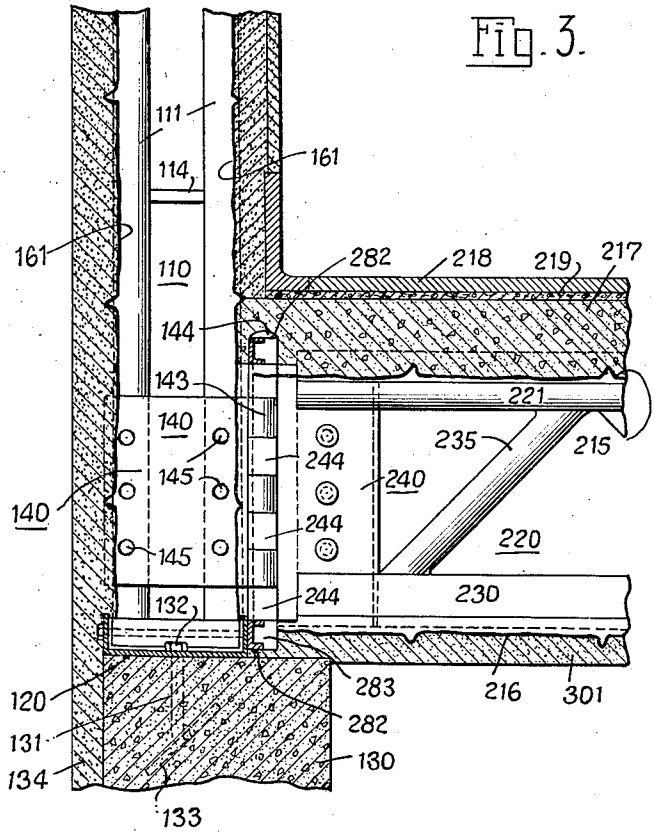


Fig. 3.



INVENTOR.
GUY F. KOTRBATY
BY Frederick A. Norton
ATTORNEY

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BUILDING CONSTRUCTION AND STRUCTURAL ELEMENT THEREFOR

Filed April 5, 1935 6 Sheets-Sheet 3

Fig. 4.

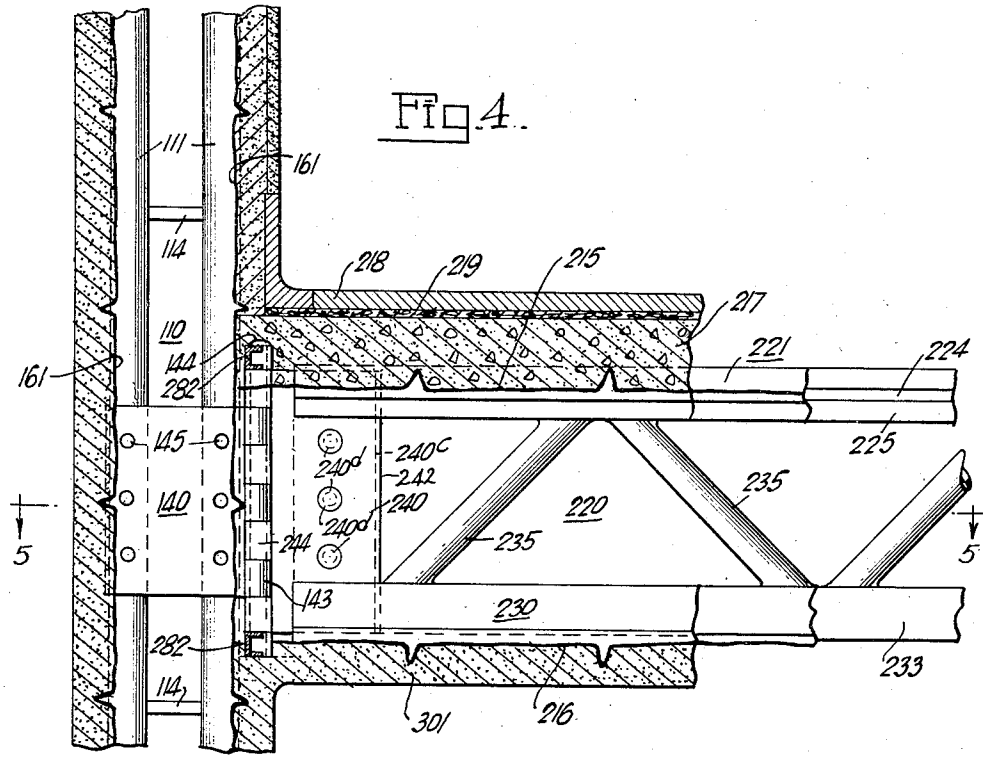
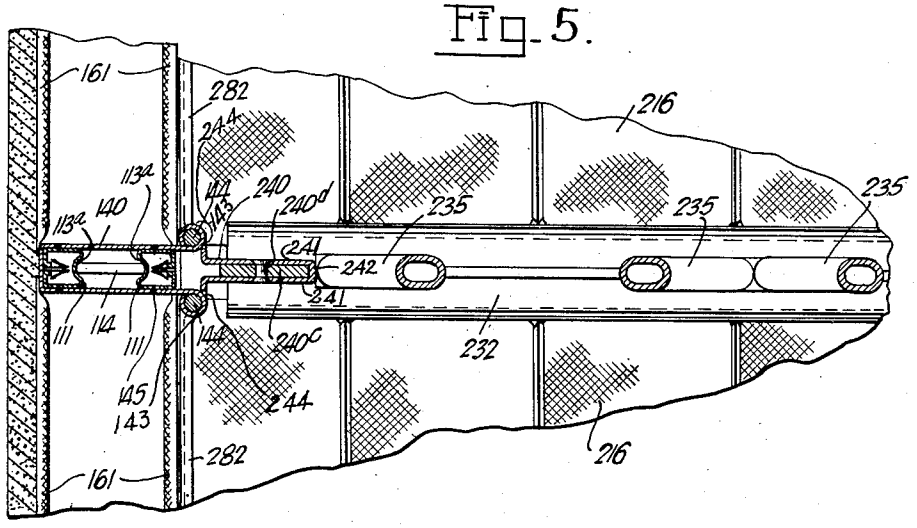


Fig. 5.



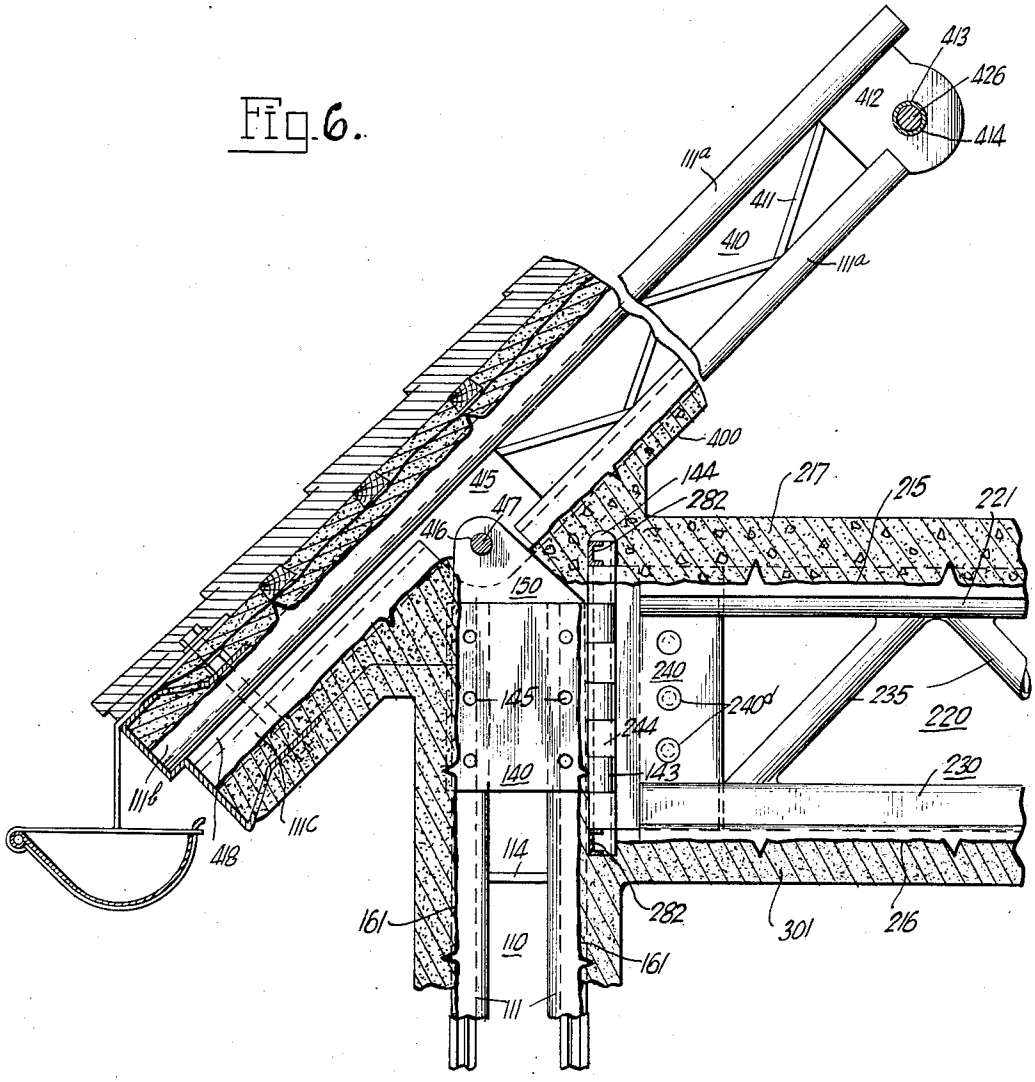
INVENTOR
GUY F. KOTRBATY
BY
Austin + Dix
ATTORNEYS

Feb. 15, 1938. G. F. KOTRBATY 2,108,065

BUILDING CONSTRUCTION AND STRUCTURAL ELEMENT THEREFOR

Filed April 5, 1935 6 Sheets-Sheet 4

Fig. 6.



INVENTOR
GUY F. KOTRBATY
BY
Austin + Dix
ATTORNEYS

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BUILDING CONSTRUCTION AND STRUCTURAL ELEMENT THEREFOR

Filed April 5, 1935 6 Sheets-Sheet 5

Fig. 7.

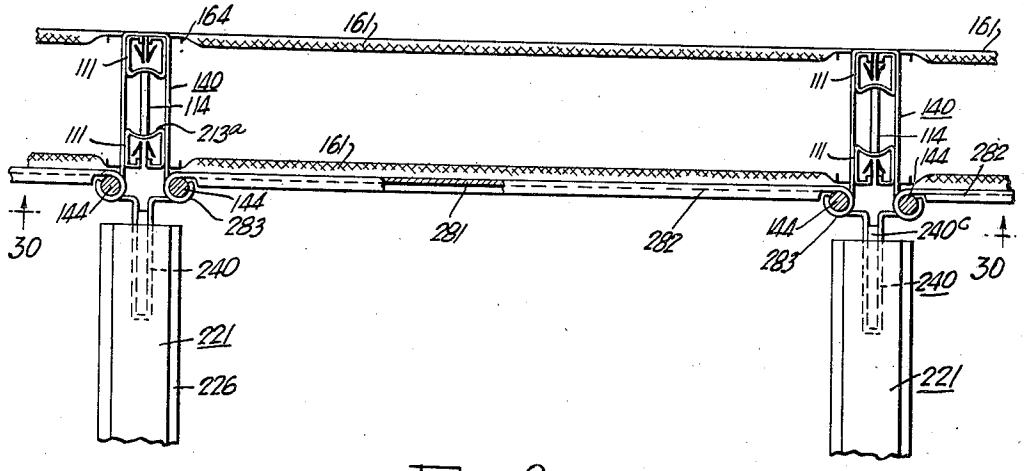
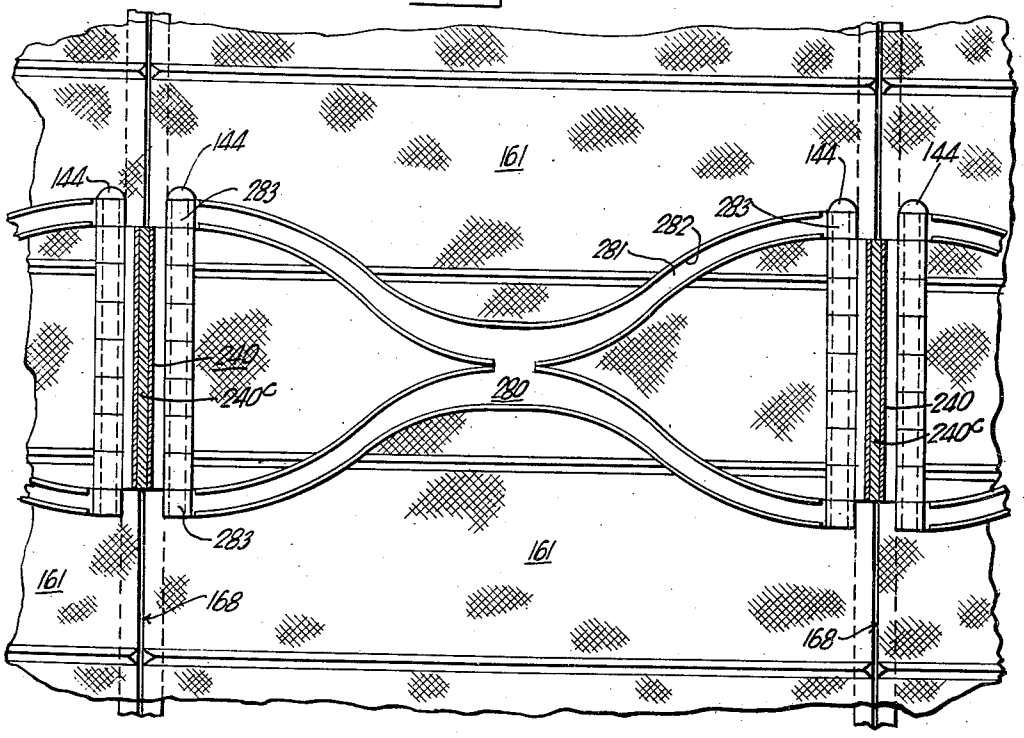


Fig. 8.



INVENTOR
GUY F. KOTRBATY
BY Austin & Dix
ATTORNEYS

Feb. 15, 1938. G. F. KOTRBATY 2,108,065

BUILDING CONSTRUCTION AND STRUCTURAL ELEMENT THEREFOR

Filed April 5, 1935 6 Sheets-Sheet 6

Fig. 12. Fig. 13.

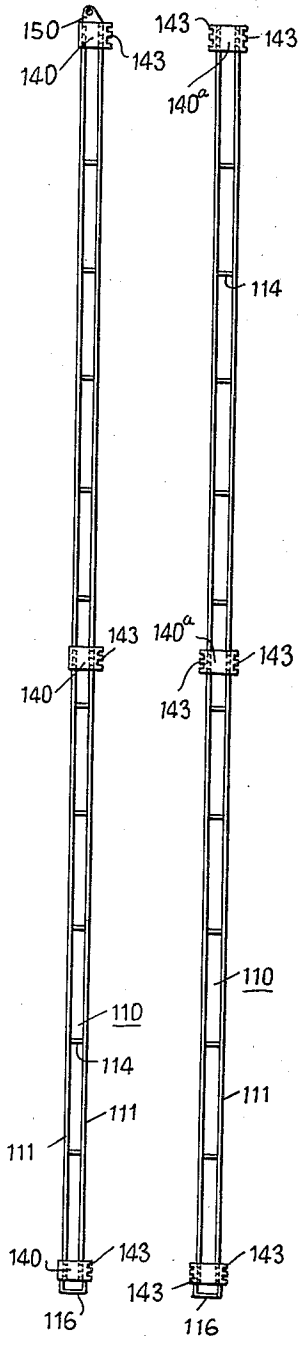


Fig. 10.

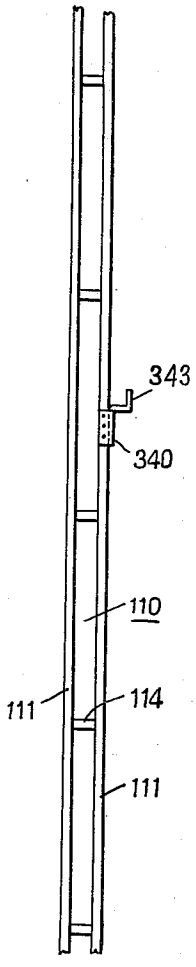


Fig. 9.

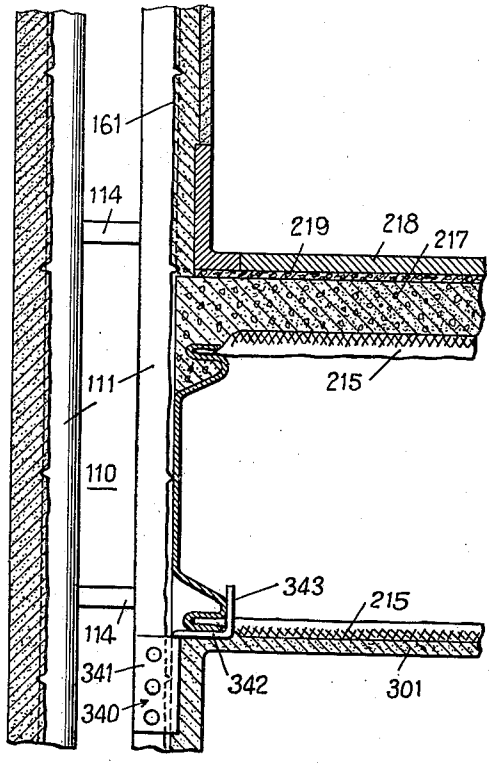
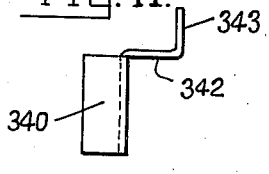


Fig. 11.



INVENTOR.
GUY F. KOTRBATY
BY Frederick A. Norton
ATTORNEY

Patented Feb. 15, 1938 2,108,065

UNITED STATES PATENT OFFICE

2,108,065

BUILDING CONSTRUCTION AND STRUCTURAL ELEMENT THEREFOR

Guy F. Kotrbaty, New York, N. Y., assignor to Fer-O-Con Corporation, New York, N. Y., a corporation of Delaware

Application April 5, 1935, Serial No. 14,808

6 Claims. (Cl. 72—1)

This invention relates to improvements in building construction and more particularly to novel building structural elements and method of assembling same in a new building system.

In my prior Patents No. 1,877,898 of September 20, 1932, Building construction and 1,968,045 of July 31, 1934, Building construction, there have been disclosed structures and methods of erecting same in which self-supporting structural building units are adapted to be keyed together to form walls, ceilings and floors and completed building structures. These structures are characterized by distinct economies in fabrication and assembly and permit the utilization of structural, cementitious plastics and aggregates with metallic skeleton constructions, the skeleton of the structure being formed of self-sustaining and self-supporting structural unit members.

For certain structural purposes it is desired to erect building structures with a minimal amount of structural cementitious plastic material, and this is accomplished by forming a skeleton metallic structure of novel and improved structural elements in new and structurally efficient combinations whereby a minimum amount of metallic skeleton material is made use of without in any way sacrificing structural strength in a resulting building structure. The novel structures herein may be readily assembled and the parts thereof, whether preformed units or parts thereof, quickly secured together in operative relationship, the walls and floors being rapidly and securely joined by the improvements to be discussed more fully hereinafter. In addition, floor, wall and ceiling panel units may be preformed in any desired sizes and of any desired structural materials and set up and locked in place after the skeleton of the building has been erected. The various panel units may be preformed, or, if desired, may be formed in place, in the several structures.

It is a feature of the present invention to provide an improved building system comprising continuous wall, floor and ceiling supporting units and parts.

It is also a feature of this invention to provide a building assembly in which the walls, floors and ceilings are generally adapted to be secured together by pin and bolt members.

Another feature of novelty of the present invention resides in the fact that wall, ceiling and floor members are so configured and arranged as to permit the automatic locking in place of a variety of panel members to form finished wall, floor and ceiling surfacings.

Yet another feature of novelty of the present invention is the provision of separate panellings adapted for cooperative association with wall, floor and ceiling structural support members, which panellings may be preformed with desired surfacings, or have desired surfacings applied thereto when erected in place in the structures.

It is also a feature of novelty of the present invention to provide improved wall-supporting structural members and studding members, together with floor-supporting members secured thereto and arranged at desired floor levels.

Another feature of novelty of the present invention is the provision of improved floor-supporting members including novel truss constructions and connections between walls and floors, including hinge-joint types of construction.

Other features of novelty of the present invention, include spacing and supporting members of novel design, as well as keying or locking members adapted for use with panellings or surfacings of various types and which are further adapted to be permanently locked in place with studding, beam, joist members, plate girders, trusses, and other structural supporting members.

These and other desirable features and advantages of the present invention will be described in the specification and building system and illustrated in the accompanying drawings, certain preferred structural members and features being shown by way of illustration only, for, since the underlying principles may be incorporated in other structural devices and assemblies, it is not intended to be limited to the features and structures here shown, except as such limitations are clearly imposed by the appended claims.

In the drawings like numerals refer to similar parts throughout the several views, of which

Fig. 1 is an elevation, partly in broken section, of a completed building structure;

Fig. 2 is a vertical section of a building structure showing wall, floor and roof joints;

Fig. 3 is a vertical section of a basement wall and floor joint;

Fig. 4 is a vertical section of an upper wall and floor joint;

Fig. 5 is a horizontal section taken on line 5—5 of Fig. 4;

Fig. 6 is a vertical detail of a roof eave connection;

Fig. 7 is a horizontal section of a wall construction with associated transverse floor members and including spacing and bracing members;

Fig. 8 is an elevation of wall construction of

Fig. 7 showing details of structural bracing and spacing members;

Fig. 9 is a vertical section through a wall or floor joint showing a modified form of floor grid support;

Fig. 10 is an elevation of the stud or stanchion member shown in Fig. 9;

Fig. 11 is an elevation of the floor-supporting bracket shown in Figs. 9 and 10;

Figs. 12 and 13 are elevations of stud and stanchion members showing hinge connection members.

Referring more specifically to the drawings and with particular reference to Fig. 1, the building walls and associated parts are designated generally by the numeral **100**; the floor members and associated structural parts are designated generally by the numeral **200**; the ceiling members are designated by the numeral **300**; and the roof members and associated parts are designated generally by the numeral **400**.

The walls **100** may be formed of a plurality of spaced stud members **110** supported on structural foundation members **120** adapted to be secured to and associated with basement foundation walls **130**, as will be described more in detail hereinafter. The floors **200** may be supported from the studding members by suitable keying members designated generally by the numeral **140**. The roofs **400** are secured in place by connecting members designated generally as **150**, which members are adapted to serve as combination flooring supports and roof-joint members.

The flooring **200** may have supporting members comprising suitably arranged units including composite joist members indicated generally at **210**. Truss members indicated generally at **220** may also be used for this purpose, as may units including composite truss members indicated generally at **230**. The several floor units and supporting members, plate girders and truss members are secured to the supporting members **140** and **150** by suitable hinge-joint connection members, indicated generally by the number **240**.

Considering the several novel features of construction herein, and with particular reference to a preferred method of assembling a building, the foundation and wall construction will first be described. As shown in Figs. 2 and 3, the foundation wall **130** may be made in the usual manner and may comprise a concrete or other basement wall in any suitable fashion. Mounted on the basement foundation and suitably aligned, is a starting and aligning channel and supporting and bearing member **120** of particular construction, which will be described more in detail hereinafter. The starting and supporting channel **120** may be secured in place by hook bolts **131** passing through the channel member **120**, the latter being held in place by nuts **132** cooperating with the bolts. The bolts are anchored in the concrete or basement foundation by means of anchored members **133**, which may be rods or the like, passing through the eye or hook of the bolt **131**. A suitable number of bolt-and-nut members may be embedded in the foundation wall and the starting wall basement members **120** secured thereto in desired alingment.

A cementitious plastic surfacing **134** may be applied to the exterior of the foundation wall or members, although it will, of course, be understood that any suitable surfacing may be applied.

The walls **100** of the buildings contemplated under the present invention may comprise supporting members **110** forming composite studding mounted on and secured by and to the starting and supporting channel members **120**, as will now be described. Referring now more particularly to Figs. 2 and 3, the channels or base members **120** comprise a generally channel-shaped member having a bottom portion **121** apertured to receive bolts **131** and to be locked in place by nuts **132** cooperating therewith. The channel members have sides **122** terminating at their upper edges in inturned stiffening and locking flanges **123**. The members **120** may also be provided with aligned apertures **124** adapted to receive bolts and nuts **125** for locking composite studding members in place, as will now be described.

The composite studding **110** of the present invention comprises a pair of opposed vertical structural supporting members **111** of generally rectangular or cylindrical shape, or any other desired configuration, which members are slotted longitudinally and are preferably provided with inturned flanges inwardly of the slots, all as indicated at **112**, whereby to provide increased stiffening effect in the members as well as to provide locking elements for wall panel constructions to be described more in detail hereinafter. The stud-like or stanchion members or sections **111** are spaced apart and held by spacers or separators **114**, which may be butt-welded to the faces **113** of the members **111**, as indicated generally at **114***a*. This construction gives a generally lattice or ladder-like construction and structural member which is rigid in all its parts. The faces or portions **113** of the stanchion members **111** may be bowed inwardly along its length, as indicated at **113***a*, to increase the stiffness and rigidity of the parallel vertical elements. In manufacture, a pair of members or vertical supporting elements **111** and appropriate spacers **114**, may be suitably mounted, in spaced parallel relation, in a jig and the whole electrically welded as by butt-welding, or they may be welded by hand, as by electric arc welding or gas welding, or brazed. It will, of course, be appreciated that other mechanical methods of securing the members together in fixed relationship, may be made use of. Among such methods may be indicated the slotting of the sections **113** of members **111** and the providing of members **114** with tongued ends adapted to fit in and engage the slots formed in sections **113**. Bolts or rivets may be used to effect the same results, but require greater time for assembly.

The lattice or composite structural studding **110** is provided with a base member or support **115** comprising an inverted channel member butt-welded or otherwise secured at its base to the bottom of the legs or members **111** of the member **110**, as indicated generally at **111***a*. This inverted channel member and support **115** in turn is transversely disposed in another channel member or shoe **116**, which shoe is provided with or has a bottom piece **117** with upstanding sides **118** provided with aligned apertures **119**, over which the sections **115** are disposed to permit the passage of bolts **125** therethrough. The shoe **116** may be welded to the member **115** as indicated generally at **115***a*.

Considering the details of these constructions it will be noted that the vertical building supporting or wall members **110** may be slidably engaged by the socketed channel or base member **120**, the foot member or shoe **116** being sprung

into place in the channel member and being locked therein, or prevented from being pulled out by the flanges 123 of the sides of the base channel or wall support 120.

The base channel 120, as previously noted, is provided with a plurality of aligned apertures 124, spaced suitable distances apart of the order of one inch more or less. The vertical supporting units comprising the shoes 116 with the integrally associated studding 110, are adapted to be moved along the base-supporting and locking channel 120 until the aligned apertures 119 in the shoe member are in alignment with a pair of apertures 124 in the base channel member. When a suitable and desired spacing between vertical supporting unit assemblies has been secured, the assemblies are permanently locked in position by inserting bolts 125 through the aligned apertures 124 and 119, and locking them in position by associated nuts of the bolt-and-nut assemblies.

It will be noted that when the bolt assemblies are tightened up the sides 122 of the supporting and base channels 120 will be pulled inwardly of the wall and towards each other so that a positive gripping and locking of the shoes 116 of the vertical structural units 110 to the base channels 120 is effected. With this construction the studding assemblies 110 are permanently and positively secured and held in a desired alignment and spacing in building wall constructions.

To permit the joining and supporting of floor constructions 200 to the studding members 110 at desired floor levels or heights, floor supporting structural members 140 and 140*a* are provided.

As indicated generally in Figs. 12 and 13, and more in detail in Figs. 3, 4, 5, 6, 7, and 8, the composite hinge floor joint construction, which is a feature of novelty of the present invention, comprises a pair of yoke members 140 and 240 which are adapted to be locked together by pin members 144, when floor trusses are used. Where floor units are used, modified connection members are used, as described hereinafter.

The yoke members 140 comprise parallel sides 141 with a base 142 therebetween and co-extensive therewith, forming a generally U-shaped member with the sides. At their ends the sides 141 terminate in hinge sections or portions 143 spaced from each other and adapted to receive other like hinge members 244 of the floor connection members, the two pairs of hinge members being held together and locked by pins 144. The yoke or spaced floor supporting members 140 are permanently secured to the studding sections 111 of the members 110 in any desired manner, as by means of spot-welds, rivets, bolts and nuts, all as indicated generally at 145. The connection member or members 240 which, while forming a part of the floor supporting members, form a component part of the composite hinge joint constructions herein, comprise a generally U-shaped member having sides 241, a base portion 242, and end flanges 243 which are outturned and terminate in coiled, hinge sections 244. The members 240 will secure and hold plate members 240*c* of floor supporting members generally. These plate members are permanently secured to the connection members 240 and held in place as by means of bolts, welds, or rivets, all indicated generally at 240*d*.

For structural uses involving central wall constructions, the members 140, as designated more particularly at 140*a* and shown in Fig. 13 are provided with a plurality of sets of looped hinge fingers 143. Where roof or gable joints are to be formed the composite studding members 110 may be provided at their upper ends with connection plates or pivot members 150, which may be formed as a part of the yoke hinge members 140, or as separate plate members held in position by the members 140.

The floor constructions, designated generally by the numeral 200, may comprise one or more types of floor supporting truss members 220, or composite floor units 210 and 250, secured to the wall or studding members 110, as hereinabove described, and provided with floor and ceiling panel members with or without associated structural plastic surfacings or coverings.

Referring now to Figs. 1, 3, 4, 5, 6, 7, and 8, novel structural members are disclosed for increasing the structural rigidity of the superstructure and maintaining a desired, accurate alignment and spacing of the several parts. Referring more particularly to these figures there is disclosed a spacing and bracing member 280 adapted to prevent weaving of the several parts of the superstructure without involving any fractional displacement from the perpendicular of the vertical structural members as well as displacement from the horizontal of the horizontal structural members. This member 280 comprises a generally flattened X-shaped member having arms 281 formed with flanges or edges 282 and terminating in hinge sockets 283 adapted to engage and mate with other hinges 143 and 274 hereinabove described. These members may be die-formed or forged to give a desired structural rigidity and toughness. The legs or sections 281 of the member 280 may be given any desired curvilinear configuration to secure a maximum of strength with a minimum of material. Thus, it is believed, the opposing strains on both sides of these members are equalized by the particular configuration of the parts thereof, so that unbalanced forces are not set up in any parts thereof or in the associated building parts with which they are connected and/or form a part. As noted in the various figures above referred to, the members 280 are spaced between and included in hinge-joint construction members and usually in such a manner that the hinge sections 283 thereof are included in and form a part of the joint-hinge construction and are held in place by the pin members 144. In use, these members, due to their construction and arrangement, will not only prevent weaving of parts in the superstructure and other parts of the structure, but in addition where used at floor levels with the hinge-joint-plate members 140 and spaced between parallel studs as shown more in detail in Figs. 7 and 8, they will afford a proper and positive alignment of the upper portion of the stud members and key them or lock them in a desired spaced relation, thus enhancing and assuring the stability of the panel members 161 without requiring the panel members to serve as structural building supporting members. This permits the use of extra light weight panelling materials which are not required to be load-bearing or stress supporting. These panel members may be locked in place in the studs, as previously described, the bracing and supporting members 280 being placed thereover and locked in position after the panellings have been secured in position. It will be noted, further, that due to the particular construction and arrangement of the members 280 a desired and effective resistance to wind-stresses is imparted to the building or

buildings in which these members are incorporated and serve for this purpose as wind-bracing members.

Considering now the truss floor members indicated generally at **220** and shown more in detail in Figs. 3, 4, 5, and 6, the truss member comprises a top chord or rail **221** having a head **222** of generally rectangular shape and hollow. This member may be described as a generally tubular member of rectangular cross-section. On its bottom side the head member **222** is provided with continuous, spaced, depending web sections **223** terminating in outturned flanges **224**, which are continued upwardly at **225** to form further stiffening and supporting flanges. The flange sections **225** are inturned at their top or upper edges, as indicated at **226**, to provide stiffening edges and retaining means for clip sections **166** of floor panels.

The bottom or tension member of the truss designated generally by the numeral **230**, comprises a generally rectangular member having a central channel section **231** terminating in lateral webs **232** which are continued downwardly to form side web sections **233**. The webs are provided with inturned stiffening edges or flanges **234** adapted to receive clipping sections **166** of floor panel members **215**. Truss rods **235** are preferably formed of tubing and are flattened at their ends, as indicated at **236**. These flattened ends are inserted in the channels formed in the top and bottom truss members **231** and **230** and are secured in place in any desired manner, as by crimping, welding, brazing, or by means of bolts and nuts, and/or rivets. Normally the member **230** may be made of heavier material than the member **221**, due to the fact that the member **230**, being the bottom truss member, is required to be a strengthening member essentially in tension, while the member **221** is exposed or subjected to compression.

The wall members or panellings and their means of adjustment to the vertical structural supporting members or studs will now be described. The wall members **160** may be composed of panels **161** of any suitable material such as metal lath in its various forms, including expanded metal lath with and without ribs. Pressed metal lath may also be used, as well as other metal sheathings including vitreous enamel sheets which are to serve as panels in and of themselves or as supporting members for plastic surfacings or preformed surfacings. Among the other surfacings which are comprehended within the purview of the present invention may be mentioned Bakelite and other condensation products when formed into panelling members; sheet rock or asbestos-base materials, generally, including cementitious aggregates of the same; gypsum and other products conformed into sheet or panel form. In addition to these general types of panelling materials, other materials, including compressed wood-base panellings with or without cement inclusions or ceramic materials. Included in the above materials will, of course, be comprehended materials such as gypsum wall board, asbestos wall board, porcelain slabs and like ceramic products, wood fibre wall boards and paper-base boards with any desired surface finishes. Among other materials comprehended within the scope of these disclosures are linoleum and cork-base sheetings or surfacings generally, ply-wood, oilcloth suitably finished and properly backed, as indicated above. The light-weight structural materials at present in use, including expanded structural materials of cement and other plastics may also be used. Some of these materials are known by the trade names, Aircrete, which is an expanded cementitious-base material; Mobelli, which is a wood-fibre cement composition; Microporite, which is a lime-sand composition; Porocrete, which is a slag cement composition; Solidon, which is, apparently, a soapstone-base composition; and other like and equivalent structural materials. Enamel steel sheets or plates can be used where desired, and may, of course, be formed with any suitable surface finish. Hardenable plastic materials when formed into sheets or panels and with any desired surface or simulated surfacings, may be used, as well as artificial and natural brick and stone materials, including thin tiles and the like, all being suitably secured to or supported on supporting members such as wire lath, or equivalent materials. In the use of metal panellings of steel and steel compositions, aluminum and its alloys, copper and its alloys, and metals and their alloys generally, which are susceptible of forming into sheets and plates, may be made use of. In the use of materials such as aluminum and copper and other metals, anodic surfacings or coatings may be formed and these oxidized coatings may be colored, as by dyeing, to cause any desired colorization and finish; but particularly, desired results are obtained with dyed aluminum oxidized surfacings in a variety of wall and panel colorings as the lakes formed are quite permanent and of good color and depth. Oxidized copper panellings may be anodically prepared to secure a variety of green colorings associated with natural weathering of such materials commonly known as verdigris. From the foregoing it will be appreciated that the wall and panel surfacings may be made of a wide variety of materials without departing from the spirit and disclosures of the present invention. This flexibility and use of material is enhanced by the fact that the panellings, as such, are not required to be load-supporting and to the further fact that they are rigidly and permanently secured in place in a special manner as will now be described.

The panel members **161**, above noted, are secured to the vertical and horizontal building supporting members in a new and improved fashion by securing members **162**. The securing members **162** are elongated channels having a base or body portion **163**, a side stiffening flange **164** on one side thereof, and an elongated flange **165** on the other side terminating in a folded-over spring edge **166**. The section **165** and associated spring-clip edges **166** are so configured and arranged as to permit their insertion in the slots or apertures formed by the inturned stiffening flange **112** of the stud members **111**. The continuous members **162** may be secured to the panellings **161** of any desired material, as above indicated, in any suitable manner, as by welding, bolts, rivets, or equivalent securing means, all as indicated generally at **167**. Where the nature of the materials used to form the members **161** permits, the sections **162** may be cast in place along the edges thereof.

It will be seen that when a pair of panels **161** with their associated securing sections **162**, are assembled in a wall so that the sections **165** are introduced into the slotted studdings **111** and the spring edges **166** snapped in the same and prevented from being pulled out by the stiffening and holding flanges **112** of the stud sections **111**, the panellings are permanently held in place.

The members 162, are preferably made of appreciable length to give an increased gripping and supporting function to the assembly. If desired the members 162 may be co-extensive in length with the panels with which they are associated or they may be formed of smaller sections or segments suitably secured to the panels along the entire length. The panels 161 may be so assembled that their supporting members 162 have to abut like members in a wall or flooring joint, to give a substantially hair-line joint 168, as shown more particularly in Fig. 8. In a finished assembly the interior space of members 111 may be filled with mastic, heavy grease and other water-repellant compositions. The filling compositions used and including cement and the like may be adapted to bond to the metal parts with which they are associated, in which case a composite structural member is formed. As previously noted, the sections 166 are spring members and should be co-extensive in length with the flanges 165 of which they form a part, or they may be formed of separate cutout fingers to more readily permit the introduction of the members 162 into the studdings 111. It will, of course, be appreciated that the sections 166 instead of being formed of continuous metal as a single member or a plurality of integral fingers, they may be formed of separate fingers welded in place on the members 165.

The securing members are generally adapted for use with floor and ceiling panels, as well as with the wall panels, care being taken in the several assemblies to use material of suitable gauge and strength for the purpose desired.

It will now be appreciated that there have been provided improvements in building constructions, including novel structural supporting members and associated parts. These improvements also include wall surfacings, comprising panel members adapted to be readily affixed and secured to wall supporting members and with or without the use of structural cementitious plastics, such as concrete, plaster, stucco, and the like. In addition, novel floor supporting systems have been disclosed which are adapted for general use in building systems, and are particularly adapted, in association with the novel wall structures herein, to form new building systems. The several structural members entering into the various building features are novel in design and function and provide, both alone and in the several combinations herein disclosed, a desirable structural strength with a minimum of weight of material. In addition, the improvements of the present invention are particularly adapted for use in the design and erection of so-called "dry" house constructions in which the several parts are preformed and assembled in place upon a finished structure, although, as already indicated, the several parts and improvements herein can be associated and erected into building structures with the aid of the usual structural cementitious plastic materials, and the like, to form the usual so-called "wet" system structures.

The terms and expressions which have been employed are used as terms of description and not of limitation, and there is no intention, in the use of such terms and expressions, of excluding any equivalents of the features shown and described, or portions thereof, but it is recognized that various modifications are possible within the scope of the invention claimed.

I claim:

1. An improved steel skeleton for building constructions, comprising channel members having gripping flanges formed at the top edge, composite stud members in the channels, said channels serving as aligning channels and supports for the shoe sections of composite stud members, the shoes being movable longitudinally of the channels whereby to permit variation of the interstud wall space; means for locking stud assemblies in and to the starting and aligning channel; wall panel securing and gripping sections formed in the outer surfaces of the composite stud members; connection plates secured to the stud members at floor heights; floor members secured to the connection plates, roof rafters joined to the tops of stud members and connected to each other at the ridge of the structure, attic flooring suspended from and secured to and between the ridge rafters; the said flooring members and roof rafter members being generally of truss-form construction.

2. In a construction of the type claimed in claim 1, the improvements comprising panel-receiving sections in the studs forming common wall-floor-ceiling-supporting members, wall panels clipped to and secured in the said panel-securing sections, and hardenable plastic surfacings on and secured to and by the said panel sections.

3. A building construction, including in combination, a basement wall, aligning and supporting channels on and secured to said wall, the said channels receiving and securing shoes of continuous multi-story vertical stud members, the shoes being nested in sliding engagement in the channels and secured thereby, and being slidable longitudinally thereof to permit variation of the interstud space; the said studs severally comprising spaced vertical members having longitudinal slots in the outer surfaces and transverse lattice-supporting members therebetween, inner and outer wall panellings having angular snap-fastening members secured thereto, the panellings being secured to the several stud members at the slotted portions thereof by insertion of the snap-lock members in the said slot, the stud members being further provided with floor-connection members comprising yoke plates and U-members overlying the stud members and provided with looped hinge sections, the said connection members being disposed at floor heights; floor-supporting members having mating hinge sections secured to the connection members, hinge pins in the hinge joint sections and locking same, the said supporting members including units having semi-truss-form side portions spacing and securing top and bottom floor and ceiling panellings, abutted units forming truss sections; roof units of spaced panellings, spaced apart and secured by semi-truss and sections mounted on the tops of the stud members and connected to each other to form the ridge of the structure, abutted units forming continuous supporting surfacings.

4. In a construction of the type claimed in claim 3, the improvements comprising auxiliary plastic keying sections of generally wedge shape formed in and by abutted semi-truss-form section of the flooring members and receiving and locking hardenable plastic materials forced therein.

5. A building construction comprising vertical supporting members slidably mounted in channel-base sections, floor connection members secured to the vertical members and of generally double hinge-joint construction, unitary truss-form, floor-supporting members secured to the

hinge-joint floor-connection members, hinge pins in and locking the hinge joint floor connection and floor supporting members, transverse stiffening members between the stud members and secured in a common joint with the hinge connections of the floor-connection plates and floor-supporting members, roof truss-form members secured to the studs and to each other to form a ridge, the said members serving as roof rafters, and means in the several vertical stud floor-supporting members and roof rafters to receive and lockingly retain preformed panellings and surfacings.

6. A building construction, comprising supporting sections including channel members mounted on basement walls, longitudinally adjustable shoes in the channels and slidable therein, locking means securing the shoes in the channels, framing members mounted on the shoes and integrally therewith, the framing members comprising lattice members having vertical supports joined by transverse stiffening and retaining members, the said vertical supports of the framing members including locking sections comprising longitudinal slots, panel members mounted on the framing members and provided with cooperative locking members fitted into the locking sections of the framing members; floor supporting members secured to the framing members at floor heights, the said floor supporting members including yokes mounted on the framing members and terminating in hinge joint sections in mating engagement with hinged joint sections of floor members, the hinge joints being secured by hinge pins, the said framing members and associated panellings forming a complete building wall structure, the framing members being initially adjustable to provide for varying panel widths and, the said framing members serving as common support for the panel members, associated floor connection and supporting members, and roof members at the upper portions of the framing members.

GUY F. KOTRBATY.