

Oct. 15, 1935.

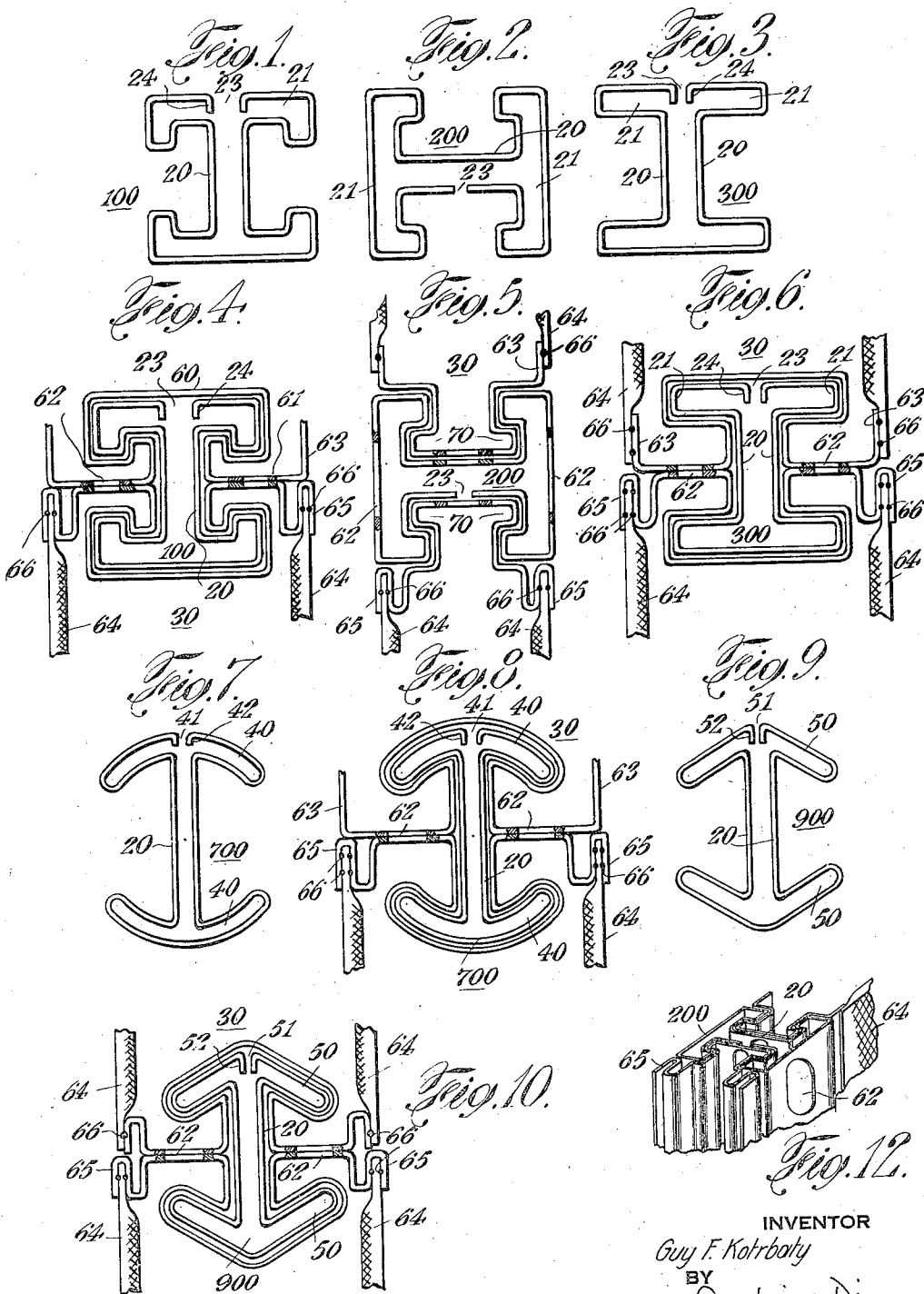
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SECURING MEMBERS FOR SELF SUPPORTING STRUCTURAL BUILDING UNITS

Filed Nov. 17, 1933

2 Sheets-Sheet 1



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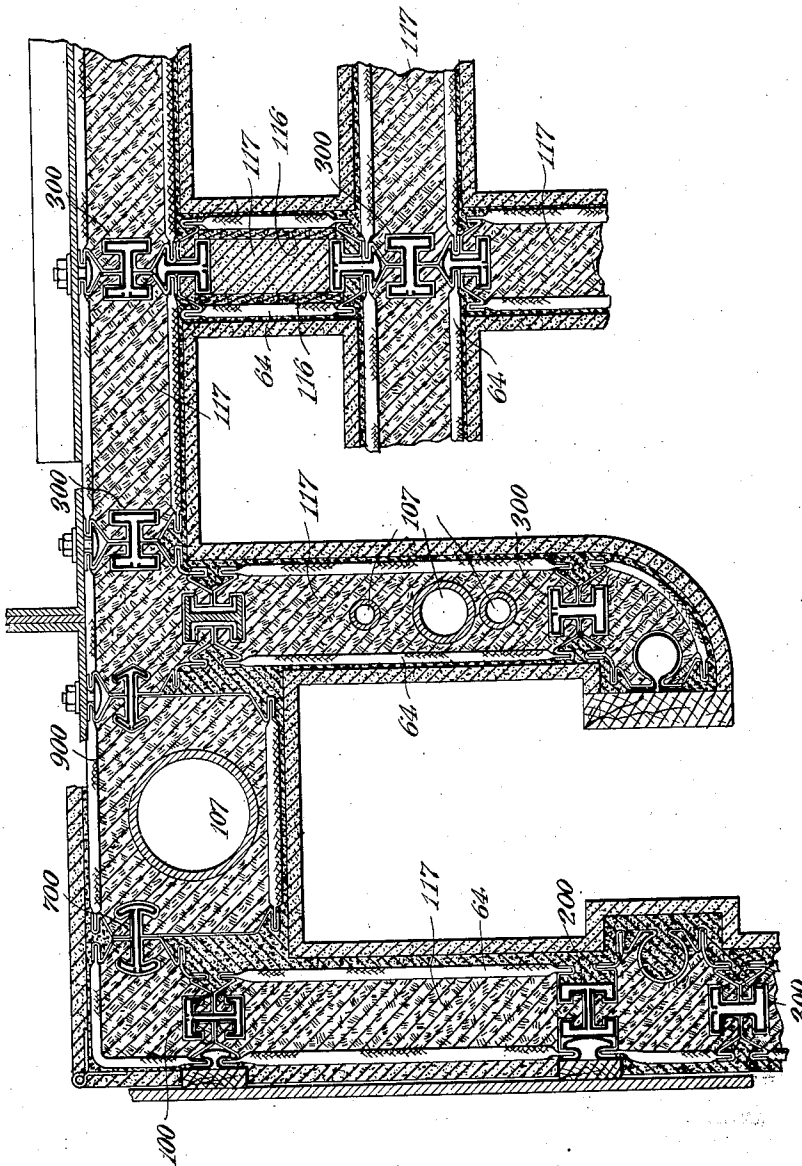
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Fig. 11.



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SECURING MEMBERS FOR SELF-SUPPORTING STRUCTURAL BUILDING UNITS

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Application November 17, 1933, Serial No. 698,433

8 Claims. (Cl. 72-115)

This invention relates to building construction and more particularly to improved securing members for use with structural members.

This invention is in part a continuation of my application Serial No. 368,226, filed June 4, 1929, for Securing members for building construction units, and allowed October 18, 1933, which said application is a division of my application Serial No. 295,705, filed July 27, 1928, for Building construction now matured into U. S. Patent No. 1,877,898, issued September 20, 1932. This application is also in part a continuation of my application Serial No. 509,237, filed January 16, 1931, for Building construction, and allowed November 3, 1933.

The specific details of my improvements having been set forth in the application above referred to, they will be presented here solely for the purpose of establishing the cooperative relationship between the several features, in order to more clearly illustrate the patentable novelty of the several parts in their specific structures and in their combinations as previously set forth.

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 similar parts throughout the several views of which Figs. 1, 2, 3, 7, and 9 are cross-sections of improved non-circular key members;

Figs. 4, 5, 6, 8, and 10 are broken horizontal sections of abutting grid members having keyways and key members fitted thereto, certain of the keyways being shown integral with the side walls of the grid units, and certain others of said keyways being shown secured to the side walls of the grid units by a variety of fastening means;

Fig. 11 is a top plan view of abutted and joined walls showing the association and locking of wall-grid units by means of keys as illustrated in Figs. 1 to 10, and showing a preferred mode of assembly, together with insulating fillings, surface coatings and associated service mains; and

Fig. 12 is an elevation, partly in broken section, of a key member in position between abutted grid ends.

Referring to the drawings, and more particularly to Figs. 1, 2, 3, 7, 8, and 9, the key members comprise spaced, expansible web portions 20 and end portion 21, either flanged or not, as desired. The edges of the sheets from which these members are rolled or otherwise suitably formed, are

spaced, as indicated at 23, to form gaps which provide a desired springiness to the constructions. These ends may be flanged, as indicated at 24. If desired, the flanges 24 may be welded, brazed, riveted or otherwise secured together to secure added stiffness in the key member. It is to be noted that these members correspond generally in structural strength to solid members of like configuration, in addition having a desirable spring-gripping effect which is not characteristic of solid members. This new construction thus provides a maximum of strength, as well as permitting the securing of a distinct saving in metal as well as marked economies in fabrication.

In use the novel key members of Figs. 1, 2 and 3, 15 designated hereafter as 100, 200 and 300 for the sake of convenience, are fitted into appropriate keyways or key members in construction units or grids 30, as will appear more in detail hereinafter.

In Figs. 7 and 9 there are shown key members 700 and 900, respectively, comprising the usual web portions 20, the construction in Fig. 7 showing arcuate end portions 40, one of the ends being provided with a gap 41 and stiffening flanges 42 permitting the spring grip. In the construction shown at Figs. 9 and 10, the web portions 20 terminate in integral angular end portions 50, one of the ends being provided with the space or gap 51 formed by the flanged edges 52 of the 30 sheet from which the member is rolled. It will be apparent that the particular configuration of the novel key members as herein shown and as shown in my applications above identified, may be varied within wide limits without departing from the spirit and scope of the invention, and without destroying the structural efficiency thereof, as composite stud, stanchion, column, beam or other supporting members.

Referring now to Figs. 4, 5, 6 and 10, grid units 40 designated generally by the numeral 30 are joined by the various keys in a manner now about to be described.

In Fig. 4 a grid 30 is provided with a keyway 60 adapted to conform to and to be engaged by 45 the flange portions 22 of the key members 100. The keyway 60 is provided with integral flange portions 61 which may be apertured, as indicated at 62, the section 61 being bent to form said side flange portions 63 which may be continuous with 50 the side walls 64 of the grid members.

If desired, as shown in Fig. 4, the member 61 may be provided with gripping flange portions 65 adapted to crimp or otherwise secure the side panels 64 in a desired position. Instead of crimp-

ing, the panels 64 may be secured to the flanges 65 by welding, brazing, soldering, or by means of rivets or wire ties, bolts, nuts or other mechanical means, all as indicated generally by the numeral

5 66. Side panels 64 may be directly secured to the straight flange ends 63 of the several key members in the usual manner, and by welding, brazing or soldering, all, as noted above, indicated by the numeral 66. The grids shown in Fig. 5
10 may be provided with special grid ends secured to the side panels in any desired manner, as indicated above, the said flange ends forming in effect flange keys 70, adapted to co-act with the keyways formed in the key members 200. These
15 members may be provided with apertures 62 permitting a desired reduction in weight of the section without impairing the structural efficiency of the combination and providing means for a plastic bonding and keying.

20 The several keys and associated keyways, whether formed integrally with the grids as ends thereof, or whether formed separately in any desired configuration and later secured to the side panels in any of the ways described above, form
25 composite structural members adapted to serve as studs, stanchions, column members and beam members. The section or thickness of the metal entering into these constructions may be varied, as desired, according to the loads to be imposed on
30 the members and whether they are to serve as vertical supporting members or as beam or floor supports.

Referring now to Fig. 11, there is shown a construction more particularly described in my allowed application Serial No. 509,237 for Building
35 construction, now Patent 1,968,045 of July 31, 1934, in which the grids are keyed together by the different types of keys, as indicated. Certain of the grids are shown filled for insulating purposes, and the like, with insulating material such as mineral
40 wool, glass wool, slag wool, ground cork, asbestos, magnesia, gypsum base materials, sawdust or other solid or pulverulent insulating materials, designated generally by the numeral 117. These
45 materials may be formed into units or blocks adapted to completely fill the interior grid spaces, or the materials may be used in bulk form filling the grids wholly or in part, as may be desired, or they may be made into slabs, blankets or sheets
50 designated, generally by the numeral 116, adapted to fit into the sides of the grids, and of such a length as to be keyed between the said sides of the adjacent keyway. While mineral insulations
55 have been described, it will, of course, be understood that any suitable vegetable insulant materials, such as sugar cane refuse, corn-stalk refuse, or other such materials may be made use of, these materials being known in commerce as bagasse, celotex and insulite.

60 The above construction prevents the transfer of heat, makes the walls sound-proof, eliminates the passage of moisture from the exterior of the house to the interior, permits the use of metal and concrete plastics in the tropics, and makes a vermin-proof house. By providing suitable apertures 62
65 in the web sections of the keyways or keys, the cross-sectional mass of the metal in the web is reduced to a minimum without reducing its structural strength. This reduction in mass of the
70 web metal imposes a distinct resistance to the travel or transfer of heat through the mass of the web as such heat transfer is essentially a function of the amount of metal available as a heat-conducting path. Such a feature increases the insulating effect between the panels 64 of the sev-

eral grid members. The usual service pipe and connections 107 may be disposed inside of the grids.

It will now be appreciated that there has been provided improved key members for self-supporting structural building members, which key members are characterized by a variety of forms and high structural efficiency when combined with abutted stanchion or stud members or beam members to form composite structural members which
10 may be readily inserted in place to lock abutted building units in place and to form with the said units, permanent structural members having the maximum of crushing and bending strength yet being characterized by a minimum of weight and
15 a desirably high resistance to the passage or transfer of heat therethrough.

While certain novel features of the invention have been shown and described and are pointed out in the annexed claims, it will be understood
20 that various omissions, substitutions and changes in the forms and details of the device illustrated and in its operating may be made by those skilled in the art or without departing from the spirit of the invention.

What is claimed is:

1. In composite structural stud members including end sections of self-supporting building units having key-receiving sections formed in the end sections, the improvements comprising key-
30 ing members in and joining abutted end sections of adjacent building units and in spring-gripping contact with the key-receiving sections and conformed thereto, the keying members including sheet metal forms having head sections of gener-
35 ally parallel, spaced walls joined and spaced by web sections likewise having spaced walls, the said head sections having edge flange portions severally bent inwardly of the keying members and towards each other, and one of the head sections
40 including a continuous longitudinal slot in the external wall thereof.

2. Sheet metal keying members for composite structural supporting members, including spaced head sections, each section comprising straight
45 sides terminating in flanged edges intumed towards each other; a web member joining the head sections and substantially in the central longitudinal axis of the inner segments of the head sections; the said head sections and inter-
50 mediate web sections severally comprising spaced, parallel sheet sections and one of the head sections having a longitudinal slit in the external face thereof.

3. Sheet metal keying members for composite structural supporting members, including spaced
55 head sections, each comprising flanged sides intumed towards each other; a web member joining the head sections and substantially in the central longitudinal axis of the inner segments
60 of the head sections; the said head sections and intermediate web sections severally comprising spaced, parallel sheet sections, and one of the head sections having a longitudinal slit in the external face thereof.

4. Sheet metal keying members for composite structural supporting members, including spaced head sections, each comprising flanged sides intumed towards each other; a web member joining the head sections and substantially in the cen-
70 tral longitudinal axis of the inner segments of the head sections; the said head sections and intermediate web section severally comprising spaced, parallel sheet sections, and one of the head sections having a longitudinal slit in the
75 head sections having a longitudinal slit in the

external face thereof, the slit having inturned stiffening flanges at the edges thereof.

5 5. Sheet metal keying members for composite structural supporting members, including a pair of spaced head sections, each comprising flanged sides of generally arcuate configuration inturned towards each other; a web member joining the head sections and substantially in the central longitudinal axis of the inner segments of the head sections; the said head sections and intermediate web section severally comprising spaced, parallel sheet sections; and one of the head sections having a longitudinal slit in the external face thereof.

15 6. Sheet metal keying members for composite structural supporting members, including a pair of spaced head sections, each comprising flanged sides of generally arcuate configuration inturned towards each other; a web member joining the head sections and substantially in the central longitudinal axis of the inner segments of the head sections; the said head sections and intermediate web section severally comprising spaced, parallel sheet sections; and one of the head sections having a longitudinal slit in the external face thereof, the slit having inturned stiffening flanges at the edges thereof.

7. Sheet metal keying members for composite structural supporting members, including a pair of spaced head sections, each section comprising flanged sides of generally angular configuration inturned towards each other; a web member joining the head sections and substantially in the central longitudinal axis of the inner segments of the head sections; the said head sections and intermediate web section severally comprising spaced, parallel sheet sections, and one of the head sections having a longitudinal slit in the external face thereof.

8. Sheet metal keying members for composite structural members, including a pair of spaced head sections, each section comprising flanged sides of generally angular configuration inturned towards each other; a web member joining the head sections and substantially in the central longitudinal axis of the inner segments of the head sections; the said head sections and intermediate web section severally comprising spaced, parallel sheet sections, and one of the head sections having a longitudinal slit in the external face thereof, the slit having inturned stiffening flanges at the edges thereof.

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