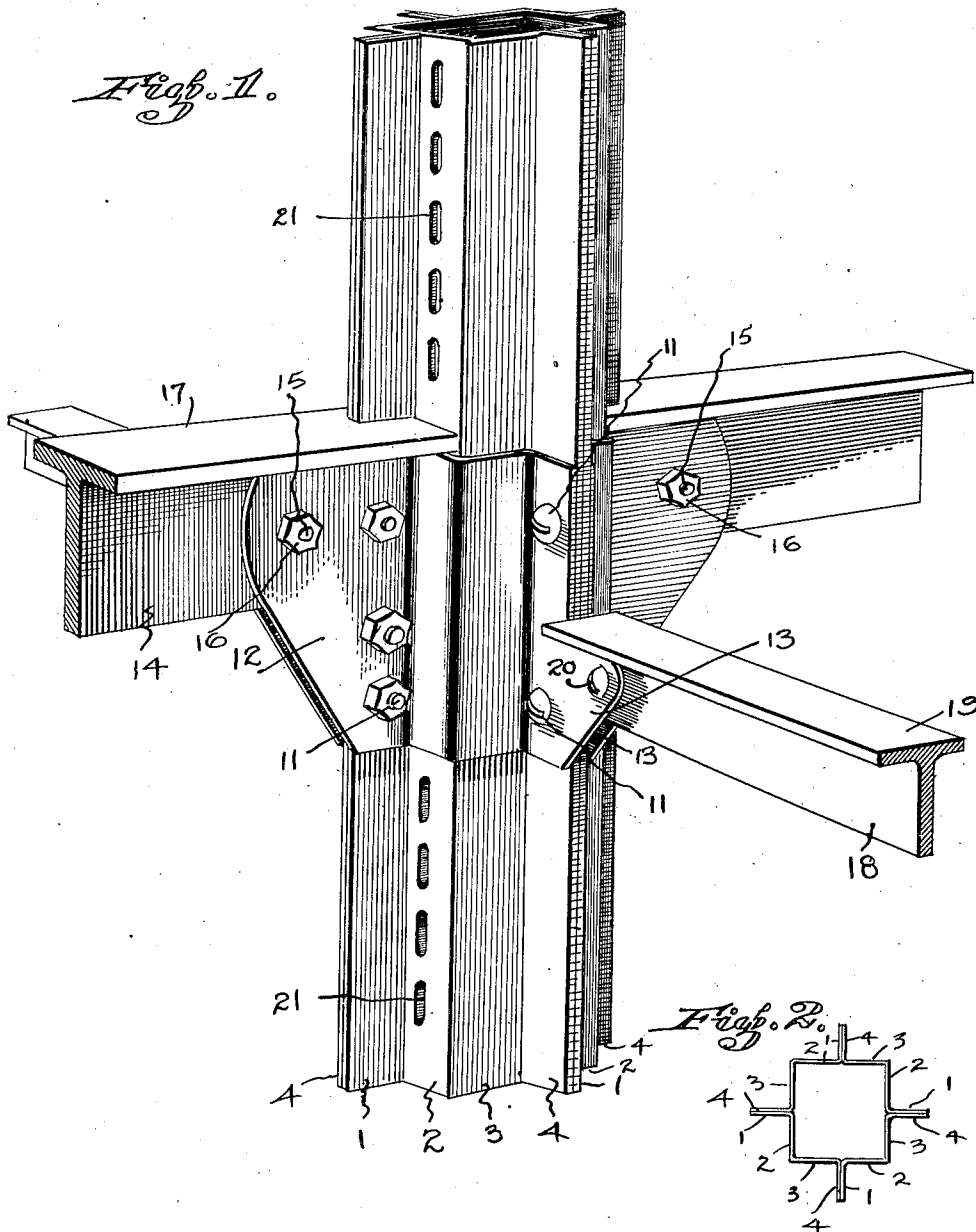


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BUILDING-STRUCTURE.
APPLICATION FILED AUG. 20, 1919.

Patented Oct. 26, 1920.
2 SHEETS—SHEET 1.



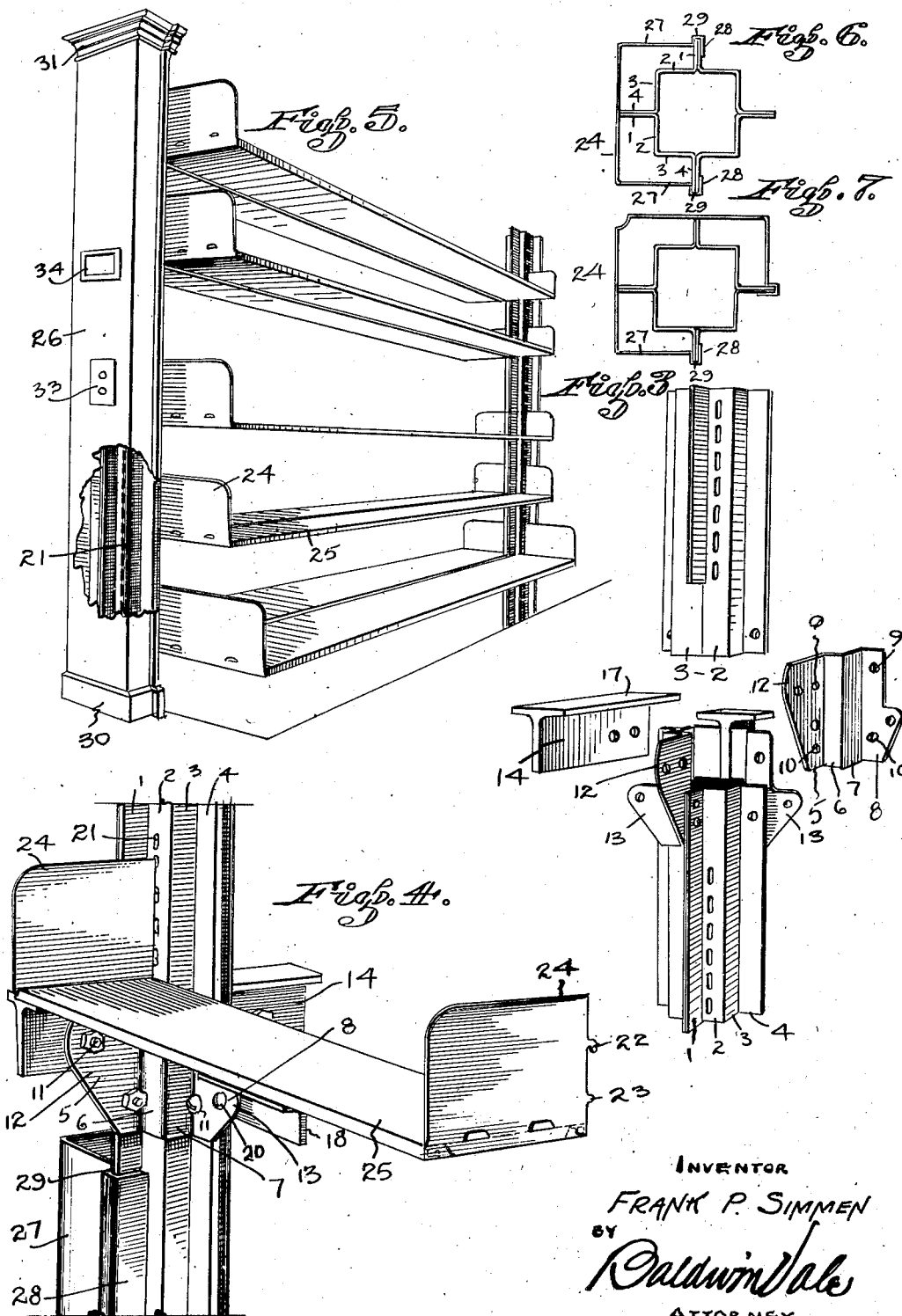
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FRANK P. SIMMEN, OF SAN MATEO, CALIFORNIA.

BUILDING STRUCTURE.

1,357,191.

Specification of Letters Patent.

Patented Oct. 26, 1920.

Application filed August 20, 1919. Serial No. 318,754.

To all whom it may concern:

Be it known that I, FRANK P. SIMMEN, a citizen of the United States, and a resident of the city of San Mateo, county of San Mateo, and State of California, have made a new and useful Invention—to wit, Improvements in Building Structures; and I do hereby declare the following to be a full, clear, concise, and exact description of the same.

The invention relates particularly to columns, girders, and braces for building structures.

Among the objects of the invention are to provide a structure of such a design that it may be made up in units and easily assembled at the point of installation; to combine the maximum strength with the minimum amount of material, and in the present disclosure arranged particularly in its application to library structures for book shelves. Another object of the invention is to provide a pilaster inclosure for the exposed column to improve the architectural appearance and to provide space for the concealment of electric and other conduits.

In this specification and the annexed drawings, the invention is illustrated in the form considered to be the best, but it is to be understood that this invention is not limited to such form because it may be embodied in other forms, and it is also to be understood that in and by the claims following the description it is desired to cover the invention in whatever form it may be embodied.

In the accompanying two sheets of drawings,

Figure 1 is a detail in perspective of a column constructed and joined in assembly with girders and braces in accordance with this invention.

Fig. 2 is an end view of the composite column.

Fig. 3 is a similar view to Fig. 1, partially disassembled to show the interrelation of parts.

Fig. 4 is a view similar to Fig. 1, illustrating the pilaster and the manner of attaching book shelves to the column.

Fig. 5 is a general view in perspective illustrating the assembly of all of the elements shown in the accompanying figures.

Fig. 6 is a plan or end view of the composite column with the pilaster sheet attached thereto.

Fig. 7 is a similar view showing a modified pilaster for corner columns.

In detail the construction illustrated in the drawings includes a column built up of a plurality of separate plates substantially W shape in cross section, the angles of which are ninety degrees to form a square column, with laterally projecting flanges. These plates are so shaped and preferably uniform in cross section, to facilitate their fabrication by cold rolling. The forming rolls are such that they form a double rectangle or corrugated strip having the planes 2, 3 and flanges 1 and 4, all of which planes and flanges are in the present instance at 90° to each other. These strips are assembled as shown in Fig. 1, the flange 1 abutting the flange 4 of the contiguous strip, to which they are spot welded or riveted to form an integral column substantially square across the planes 2 and 3, and having laterally extended flanges on all four sides formed of the flanges 1 and 4 joined as described. A column of this construction will withstand great compressing strain longitudinally, relatively to its weight, at the same time combining great lateral rigidity, owing to the extended flanges.

A further advantage of a column of this shape is the facility with which the ends may be joined to the contiguous sections to form a continuous length. Joining of the abutted ends of column sections is accomplished by the joining plates, similar in cross section to the strips forming the column and formed with the planes 5, 6, 7 and 8 adapted to fit snugly against the planes 2, 3 and flanges 1 and 4 or nest in the sides of the column, four plates being required to form a joint. The planes 5 and 8 are provided with holes as at 9—9 and 10—10, registering with holes through the laterally extended flanges 1—4. These holes are arranged so that the ends of the column sections lie in contact, so that when the bolts 11 having the nuts thereon are pulled tight, the abutting ends of the column sections are held in rigid relation by these tension members.

Joints in the column occurring at floor levels, as illustrated in Fig. 1, are provided with the extension brackets 12 and 13. The stem 14 of the T iron forming the floor girder extends between the brackets 12, between which it is securely clamped by the bolts 15 passing therethrough, and provided with the nuts 16 threaded thereon. For greater support and rigidity of the floor girders, I prefer to cut away the adjacent

flanges 1—4 on opposite sides of the superposed column end, a distance back from the end thereof equal to the height of the girder (see Fig. 3) whereby the end of the girder abuts the planes 3—2 of the column section and the head 17 of the girder overhangs the joining plates beneath the flange 1—4 of the upper column section. The bolt through the hole 9 also passes through the stem 14 of the girder holding the end thereof in rigid connection with the upright column, the bracket 12 also acting as a corner gusset. In Fig. 1 the floor girders are shown as extending from the supporting column from opposite sides. It is obvious however, that they may be joined to the column on one or all four sides by the means described. In the present instance, however, for library shelving, the construction illustrated in Fig. 1 is sufficient. Lateral stability between the columns is accomplished by the stay bars 19, preferably also of T cross section having the stem 18 confined between the bracket 13 by the bolt 20 passing therethrough with the end of the stay bar abutting the edge of the contiguous flange 4—1 of the column, and the head 19 overhanging the brackets 13 on the joint plates. The floor girders and the stay bars may be on a common level, or the stay bars may be below the level of the girder tops by shaping the brackets 13 as shown in Fig. 1. The girders and other attachments to the column vary with the nature of the structure, necessary modifications being within the purview of this invention.

Because of the great strength, the interchangeability of parts, and the uniformity of this structure, it is adaptable to many uses other than those suggested herein.

To accommodate adjustable shelving for books, the planes 2 and 3 on opposite sides of the column may be perforated as at 21, to receive the hooks 22 and the studs 23 formed on the ends 24 of the book shelves 25, extending between adjacent columns (see Figs. 4 and 5).

When it is desired to ornamentally disguise the column I provide the ornamental pilaster 26 (see Fig. 5). This preferably consists of a strip of material bent in substantially channel shape, having the sides 27 and the intumed edges 28 forming grooves at 29 engaging the flanges 1—4 on opposite sides of the column. These pilasters can be sprung open sufficiently to pass the edges 28 over the edges of the flanges or they may be assembled endwise on the column section before the latter are joined together. The pilaster rests upon a base 30 which may be integral therewith or preferably detachable to facilitate installation of floor plates, marble slabs, or any other form of floor. These pilasters are surmounted by a removable cap 31 of orna-

mental design. The space within the pilaster provides ample room for the reception of electric conduits or wiring to the switch 33 fixed to the outside of the pilaster. These pilasters contribute to the architectural finish of the structure and provide convenient surface for the reception of guide cards 34 and the like.

For corner columns I provide a modification of the pilaster illustrated in Fig. 7. These pilasters may be embossed, fluted, or otherwise ornamented.

Having thus described this invention, what I claim and desire to secure by Letters Patent is:

1. A metal structure including a polygonal column having laterally extended flanges; a plurality of joining plates nesting in the angles of said column between said flanges; tension members extending through said plates and said flanges; and an angular girder having a part engaging one of said tension members between two of said joining plates, and its end abutting the side of said column in a cut away portion of the adjacent said flange.

2. A metal structure including a polygonal column having laterally extended flanges; a plurality of joining plates nesting in the angles of said column between said flanges; tension members extending through said plates and said flanges; and brackets on said plates extending beyond said flanges.

3. A metal structure including a polygonal column having laterally extended flanges; a plurality of joining plates nesting in the angles of said column between said flanges; tension members extending through said plates and said flanges; and integral brackets on said plates extending beyond said flanges.

4. A metal structure including a polygonal column having laterally extended flanges; a plurality of joining plates nesting in the angles of said column between said flanges; tension members extending through said plates and said flanges; brackets on said plates extending beyond said flanges; and girders fixed to said brackets.

5. A metal structure including a polygonal column having laterally extended flanges; a plurality of joining plates nesting in the angles of said column between said flanges; tension members extending through said plates and said flanges; brackets on said plates extending beyond said flanges; girders fixed to said brackets; and struts fixed to said brackets below the level of the top and transversely to said girders.

6. A metal structure including a polygonal column having laterally extended flanges; a plurality of joining plates nesting in the angles of said column between said flanges; tension members extending through said plates and said flanges; brackets adjacent

said joining plates; a girder fixed between said brackets and having its end abutting the side of said column beneath a cut away portion of the adjacent flange.

- 5 7. A metal structure including a polygonal column having laterally extended flanges; a plurality of joining plates nesting in the angles of said column between said flanges and overhanging the end of said column;
10 and tension members extending through said plates and said flanges; and integral brackets on adjacent said plates and extending

beyond the contiguous flange; a girder fixed between said brackets and its end extending across said flange; and a superposed column fitting within said joining plates. 15

In testimony whereof, I have hereunto set my hand at the city of San Francisco, California, this 11th day of August, 1919.

FRANK P. SIMMEN.

In presence of—

LINCOLN V. JOHNSON,
A. J. HENRY.