Inventors: Paul L. Battey, Harold J. Williams

Attorneys: Remmel, Remmel, Woodworth
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P. L. BATTEY ET AL

BUILDING CONSTRUCTION

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3 Sheets-Sheet 3

INVENTORS

Paul L. Battey
Harold S. Williams

BY

Attorneys
The invention covered by this application relates to building construction, and is particularly adaptable for use in either one-story buildings or in certain portions of multi-story buildings.

For the purposes of this specification, the elements of a single story building may be divided into three general groups as follows:

Substructure, consisting of foundations and floor elements.

Supporting structure consisting of columns, posts, and walls.

The essential parts of our construction may be made of structural materials such as steel or non-ferrous metals or wood of either standard or special structural shapes. They may be of the hot-rolled, extruded or may be plates or sheets formed by cold rolling, shaping or pressing with fabrication by riveting, bolting, welding or interlocking.

In general, our invention deals with the structural framing, which includes supporting columns and roof-framing, together with structural elements combined in various ways to provide natural lighting to the space below the roof, as through "A-frames", or other types of skylights or monitors which have, in certain parts of their areas, light-transmitting elements such as glass, or other translucent materials suitable for such use, in supporting frames, skylights and the like.

Some of these light-transmitting areas or frames may be arranged to open and thereby provide ventilation to the space below the roof if desired, a solid roof may be used.

Different types of columns, with the contiguous material may be used independently, or they may be used jointly. Some of the types of columns used for this purpose, may be called respectively "one-way T-columns" and "two-way T-columns".

The one-way T-column consists of a post or a column 1, the top part of which has two symmetrically extended arms 2, opposite to each other, and having a common axis. At the extremities of the arms 2 are attached members 3 of the roof-framing to the said arms 2. By this arrangement, no roof-framing need be supported directly by framing into the column, but is supported rather through the medium of the arms 2 into or upon which the supplementary roof members, as the beams 2, are attached for their support.

The two-way T-column consists of a post or column 4, the top part of which has four extended arms 5, 6, 7 and 8, set 90° apart in opposite pairs, and may be set in directions bisecting the angle between the longitudinal and transverse center lines of the building, as shown in Figs. 4, 5, 6 and 8. To the extremities of the said arms is attached the roof-framing which may be entirely supported from or at the extremities of said arms, either by framing into or upon them.

The main objects of our invention are to provide articles of manufacture that will facilitate the planning of buildings to be erected and will provide suitable supporting parts of standard design for ready manufacture and possibly be stocked in certain instances for prompt supply; to provide for the effective use of a minimum amount of structural metal or materials, a minimum volume of space required for structural members, and a highly efficient use of all members of the supporting framework of the building; and to facilitate the use of a variety of efficient methods of lighting and ventilation through the roof or if desired in some instances, a solid roof.

These objects and features of utility, and others that will appear from the description, are accomplished by the constructions illustrated in the accompanying drawings, in which:

Fig. 1 is a top plan of one of our supporting columns with horizontally disposed arms extending in opposite directions. We refer to this column, shown in Figs. 1, 2, and 3 as a one-way T-column.

Fig. 2 is an elevation of the same column partly broken away.

Fig. 3 is a perspective view of said column.

Fig. 4 is a top plan of one of our two-way T-columns, partly broken away, and which column is otherwise shown in Figs. 5 and 6.

Fig. 5 is an elevation of the same construction looking toward the angle between two of the adjoining horizontally disposed arms, the upright member 4 being partly broken away.

Fig. 6 is a perspective view of one of our said two-way T-columns.

Fig. 7 is a perspective view of part of a build-
employing our said one-way T-columns shown in Figs. 1, 2, and 3.

Fig. 8 is a perspective view of part of a building employing our two-way T-columns shown in Figs. 4, 5, and 6.

The column 1 and arms 2 may be made of I-beams. The two-way columns 4 may also be made of I-beams by using two parts of T's of similar shape, and welding them at right-angles to the others.

There are, of course, many ways in which the various parts of our constructions may be made; the parts may be connected together in various ways, as riveting, bolting, or welding, etc. The metal parts may be made by stamping cold-rolling or otherwise forming to provide columns and arms as standard articles of manufacture, of standard sizes and forms, so as to be capable of being furnished from stock to meet estimates and plans of building constructions which may thus be accurately made in advance so as to result in a substantial saving of time and of ultimate expense.

Among the advantages or features of utility made possible, or promoted, through the use of our invention are the following:

Economy, through duplication of structural column and beam units, use of column-bracket units, or heads, so as to permit shortening of the panel-framing members in one or both directions with resultant economy of structural members; minimum amount of framing in panels with minimum obstruction of lighting by natural means; simplicity of construction; maximum duplication of roof-framing units which are of the minimum size for distance between columns; variety of roof-lighting arrangements, and ventilating arrangements, which may be used with one type of supporting structure; wide variety of column spacing and provision for different bay-units without changing the columns or the span of their arms; absence of fixed projections on the column-arms below or above the same, so as to provide for a neat ceiling clearance line, and for unobstructed use of A-frames, monitors, or skylight spaces; trim appearance, free from unsightly members and bulky appearing connections; use by designers, of a variety of structural elements of predetermined or tested strength or load-carrying capacity, in their own designs, and with the possibility of using a wide range of closure-devices or forms to suit the individual tastes or requirements of the designers; and providing for columns and arms and extensions which may be prefabricated, in whole or in part, for rapid manufacture or combining, or for prompt shipment from stock, and which may be readily made in different lengths, in standard or stock sizes to facilitate prompt shipment.

In Fig. 7 the arms 2, on the one-way columns, are shown continuous with connecting frame members as if welded thereto. The frame members 10 of the roof are supported on the extensions or arms 2. Said members 10 carry the roofings 11 and the frames 12 of the lighting and ventilating devices.

In Fig. 8 the arms 5, 6, 7 and 8 on the uprights 4 have their ends connected directly to the roof-framing 13 on which are supported the roofings 14 and the lighting and ventilating frames 15, which obviously may be made of any different forms and designs without departing from the spirit of our invention as defined by the claims hereinafter presented.

We claim:

1. A building frame comprising a plurality of column units each having a vertical member and a horizontal beam member extending across the top of the column in integral T-shape, a plurality of horizontal beams connecting the ends of the horizontal beam members of successive column units, and deck frames members spanning the spaces between the opposed ends of the beam members of successive columns and arranged to impose their loads on said columns only at the end, of the top beam members.

2. An all metal building frame comprising a plurality of structural metal column units, each comprising a vertical member and a pair of crossed horizontal members intersecting each other at the top of said vertical member, and a plurality of horizontal beams connected end to end to said members and each spanning the space between the ends of horizontal members of successive column units and being disposed at an oblique angle to said horizontal members.

3. An all metal building frame comprising a plurality of structural metal column units each comprising a vertical member and a plurality of horizontal arms extending in different directions, from said vertical members, and a plurality of horizontal beams connecting the ends of the arms of successive column units, and arranged in pairs diverging at a right angle to each other and symmetrically diverging from the ends of the respective arms.

PAUL L. BATTLEY.

HAROLD S. WILLIAMS.