May 18, 1948. J. A. LARKIN 2,441,890

JOINT FOR STRUCTURAL STEEL COLUMNS AND GIRDERS

Filed Feb. 15, 1946

Fig. 1.

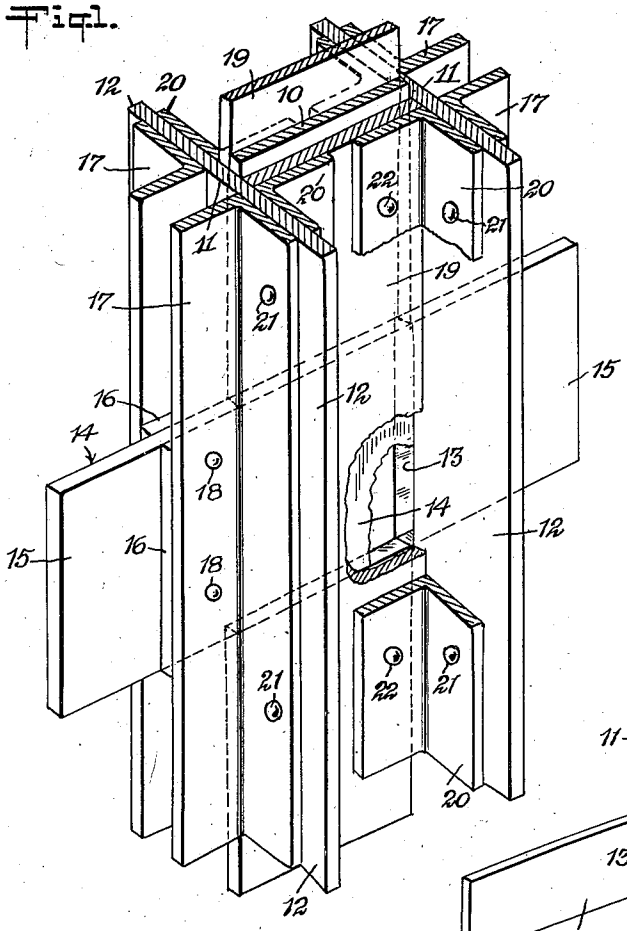


Fig. 3.

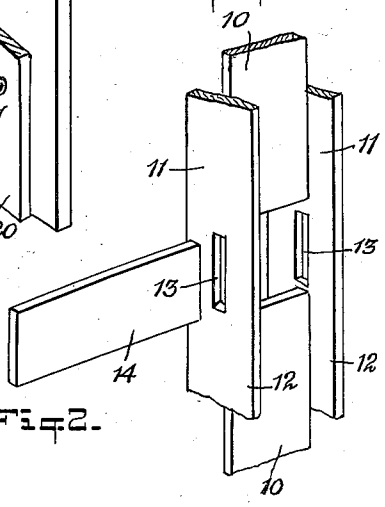
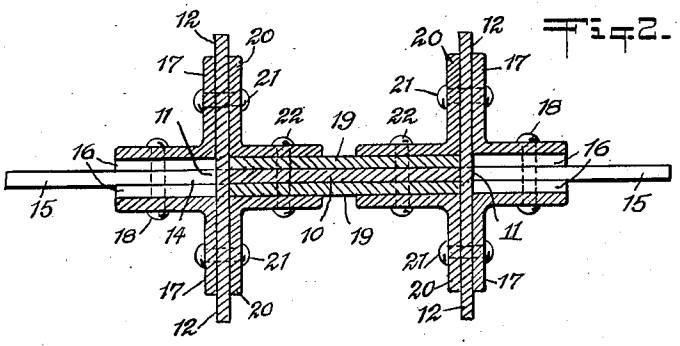


Fig. 2.



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Patented May 18, 1948 2,441,890

UNITED STATES PATENT OFFICE

2,441,890

JOINT FOR STRUCTURAL STEEL COLUMNS AND GIRDERS

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Application February 15, 1946, Serial No. 647,691

4 Claims. (Cl. 189—36)

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This invention relates to fabricated or built-up steel framework used in the erection of buildings and other structures.

More particularly, the invention relates to a joint construction between columns and girders or beams such as disclosed in United States Letters Patent No. 1,727,293 granted to me.

This joint construction includes the use of gusset plates integrated in a column to provide means for connecting beams or girders to the column and sustaining the same.

The principal object of the present invention is the provision of a structural integrality in which use is made of continuous elements which serve as splice plates, to aid in holding the gussets in place as parts of the web of a column, and to reinforce the formed web throughout the entire length thereof in proportion to the thickness of the splice plates and in such ratio, as to increase the bearing capacity of the column, and also to add to the value of the column's resistance to the torsional or twisting strains to which the column is subjected.

The nature of the invention and its distinguishing features and advantages will appear when the following specification is read in conjunction with the accompanying drawing, in which—

Fig. 1 is a sectional perspective of a column section with a gusset fabricated in accordance with the present invention, portions being broken away to show certain features.

Fig. 2 is a horizontal sectional view.

Fig. 3 is an exploded perspective view showing certain parts of the column section.

According to requirements, columns for the erection of exceptionally high buildings, are each composed of sections joined in longitudinal alinement. It is to this type of column to which the present invention is primarily applied.

The built-up column includes elongated plates 10 and 11. The plates 10 constitute the web of the column. The plates 11 are arranged at right angles to the plates 10 and provide flanges 12. The web plates 10 are vertically spaced apart. Each of the plates 11 has slots 13 therein, equal in size to and in alinement with the space between the web plates 10. A plate 14 extends crosswise of the plates 11 in a pair of registering slots in the plates 11 with the adjacent ends of the web plates 10 abutting the plate 14. The plate 14 constitutes a gusset in the plane of the web and forms a part thereof. The opposite end portions 15 of the gusset 14 project beyond the plates 11 for the connection of suitable beams or

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girders therewith. Fillers 16 are laid flatwise against the portions 15, respectively, on opposite sides thereof, and abut the flanges 12. Connecting angles 17 abut the fillers 16 and the flanges 12. Rivets 18 extend through the angles 17, fillers 16 and portions 15 to rigidly connect the gussets 14 to the flanges 12.

In order to complete the built-up column elongated plates 19, which are equal in length to the length of the column section, are laid against the web 10 on opposite sides, respectively. These plates 19 therefore extend over the gussets 14 since the latter are in the plane of the web 10. The plates 19 constitutes splices. The plates 19 are substantially equal in width to the width of the web 10 and are substantially equal in thickness to the thickness of the fillers 16. Connecting angles 20 abut the flanges 12 and the splice plates 19 at each side of the web 10. Rivets 21 extend through the contiguous angles 17 and 20 and flange 12 at each side of the web. Rivets 22 extend through the angles 20, splice plates 19 and the web plates 10. The parts are thus rigidly secured to each other to produce a column section which is compact with a continuous reinforcement of the web throughout the length of the column section by reason of the nature and arrangement of the splice plates. Also, the gussets are securely integrated in the column section, as well as being reinforced by the splice plates. A column made of sections constructed in the manner illustrated and described has increased load bearing capacity, and added strength in resisting torsional or twisting strains and stresses to which the column is subjected.

I claim:

1. In a structural steel column section of predetermined length, web plates vertically spaced apart, flange plates arranged at right angles to the web plates, said flange plates having slots therein respectively, the length of each slot equal to and alined with the space between the web plates, a gusset plate positioned between the web plates in the same plane and projecting through said slots, splice plates positioned on opposite sides respectively of the web plates and the gusset plate in contact therewith flatwise, each splice plate being coextensive in length with the length of said column section and each splice plate being the same width as the web plates, connecting angles abutting the flange and splice plates, securing means extending through said angles, splice plates and web plates, and securing means extending through said angles and flange plates.

2. In a structural steel column section as set

forth in claim 1, fillers laid against the projecting end portions of said gusset plate, angles abutting the fillers and flange plates, and securing means extending through said last mentioned angles, fillers and the projecting portions of said gusset plate.

3. In a structural steel column section, web plates vertically spaced apart, flange plates abutting the web plates at right angles on opposite sides respectively, said flange plates having longitudinal slots therein in registry with each other and with the space between said web plates, a gusset plate positioned between said web plates in the same plane and projecting through said slots, splice plates laid against the web plates and gusset plate on opposite sides respectively and in contact therewith flatwise, each of said splice plates substantially equal in width to the width of the web plates and extending continuously from one end of the column section to the other end, and means securing the splice plates to the web plates and flange plates.

4. In a structural steel column section as set forth in claim 3, fillers laid against the projecting end portions of the gusset plate on opposite sides respectively, said fillers being substantially equal in thickness to the thickness of the splice plates, and securing means integrated with the first mentioned securing means and extending through said fillers and the projecting end portions of the gusset plate.

JOHN A. LARKIN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,727,293	Larkin	Sept. 3, 1929
1,791,897	Hyde et al.	Feb. 10, 1931