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J. A. LARKIN

2,720,291

REINFORCED GIRDER END CONNECTION

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Fig. 1.

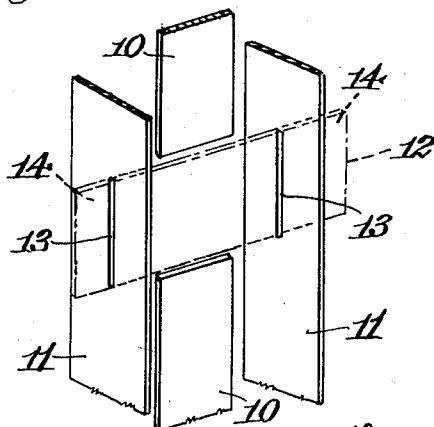


Fig. 2.

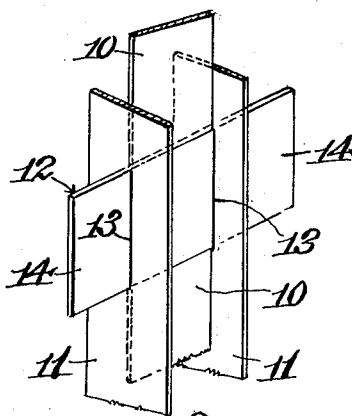


Fig. 3.

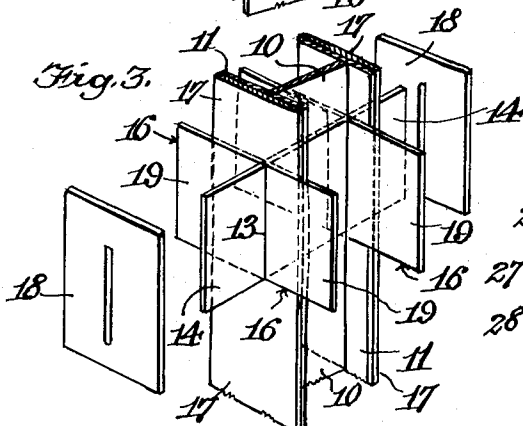


Fig. 6.

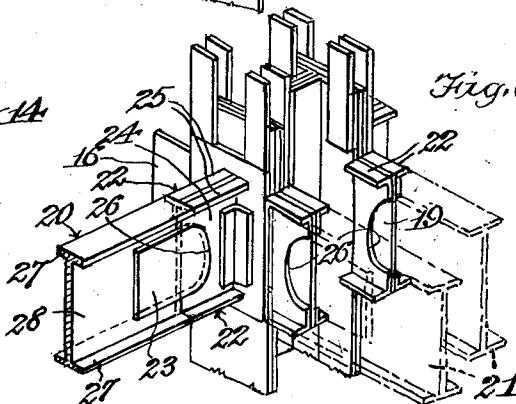


Fig. 4.

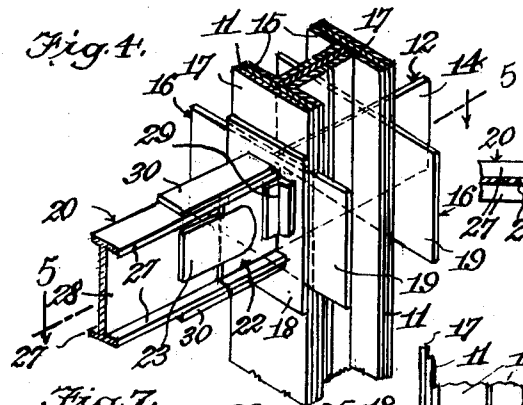


Fig. 5.

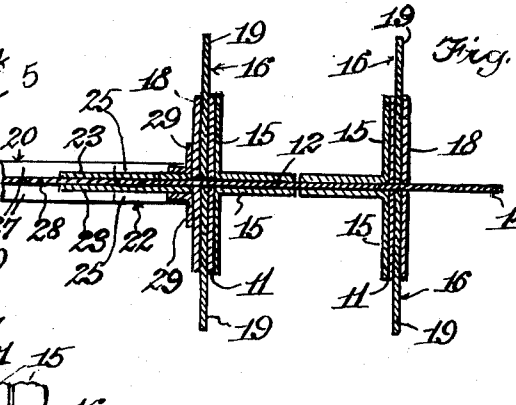
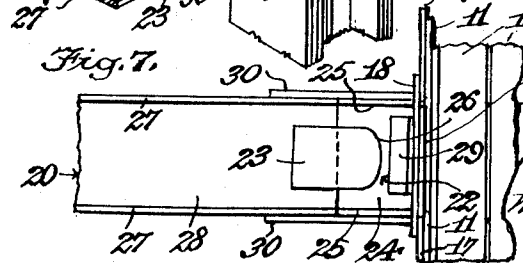


Fig. 7.



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REINFORCED GIRDER END CONNECTION

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2 Claims. (Cl. 189—36)

This invention relates to structural steel framework such as is disclosed in my United States Letters Patents No. 1,727,293, No. 2,375,116, and No. 2,441,890.

More particularly, the present invention relates to structural steel columns, girders or beams, and the means for connecting or joining the girders or beams to the columns.

This invention contemplates the fabrication of main load sustaining structural elements of the indicated character which are so connected or joined to each other that adequate safety factors are met regarding expansion, contraction, wind stresses and strains, and gravity load requirements, especially in the framework of high or high-stress buildings.

With the foregoing, other objects and advantages of the invention will appear when the following description is read in conjunction with the accompanying drawings, in which,

Figs. 1, 2, 3 and 4 are perspective views illustrating stages in the construction of a section of a main column.

Fig. 5 is a sectional view taken on the line 5—5 of Fig. 4 and looking in the direction indicated by the arrows.

Fig. 6 is a perspective view illustrating a portion of a gusset column section, column splicing members, web and flange gussets for connection with the ends of six girders.

Fig. 7 is a fragmentary side view showing the means connecting one end of a girder to the column, and the means splicing a girder to one end of a web gusset.

In Figs. 1 and 2 of the drawings there are shown portions of components 10 and 11 of a fabricated main column section. It is to be understood that columns of comparatively high building structures are each made of sections approximately thirty-five feet in height. Also it is to be understood that the various parts as assembled will be riveted as required, and for the sake of convenience and clearness the rivets have been omitted from the drawings. The components 10 in the form of elongated plates constitute the web of the column, and the components 11 in the form of elongated plates constitute the flanges of the column. The components or plates 10 are vertically spaced as shown in Fig. 1 to accommodate a web gusset plate 12 extending crosswise of the completed column. The components or plates 11 each have a central vertical slot 13 to accommodate the gusset plate 12 with the opposite end portions 14 of the gusset plate projecting from the opposite sides respectively of the completed column, as indicated in Fig. 2. Interior angles 15 tie the web plates 10 to the flange plates 11 and the gusset plate 12.

The web gusset plate 12 serves for connecting or joining two girders to the column, wherein the end portions 14 about the related ends of the girders, which latter will be disposed in alignment with each other and at right angles to the column. If desired, as illustrated in Figs. 3-6, use also may be made of flange gusset plates 16 which are disposed flatwise against the flange plates 11, between and in edge contact with vertically spaced plates 17 laid against said flange plates 11, and between said flange plates 11 and a cover plate 18. The end portions 19 of the flange gusset plates 16 project from opposite sides respectively of the column, and are disposed at right angles with respect to the end portions 14 of the web gusset plate 12. The end portions 19 serve for joining four additional girders to the column, wherein said end

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portions 19 about the related ends respectively of said four additional girders.

In Fig. 6 there is shown a portion of a girder 20 associated with the gusset plate 12 and portions of two girders 21 of the above mentioned four girders associated with the flange gusset plates 16. It is to be understood that the number of girders connected to a column in accordance with the invention depends upon requirements of design of the framework and the location of the column in the framework.

In accordance with the principal features of the present invention each girder is connected with the intended gusset plate by means and in a manner presently to be described. Use is made of interengaging or interlocking members 22 and 23, there being two similar members 22 and two similar members 23. Each of the members 22 is of channel formation providing a web 24 having upper and lower flanges 25, said web 24 having a notch 26 in one end. Each of the members 23 consists of a short plate, one end of which is complementary to the intended notch 26 so as to snugly fit therein. The members 22 are secured to each end portion 14 or 19, as the case may be, on opposite sides respectively. The cross-sectional size and shape of each member 22 are substantially similar to the corresponding abutting end portions of the girder. Therefore the flanges 25 are in alignment with the flanges 27 of the girder while the web 24 is offset with respect to the web 28 of the girder. The members 23 are secured to the web 28 at opposite sides respectively, and project beyond the web 28. When the girder is abutted endwise with respect to the related gusset plate, the projecting end portions of the members 23 extend into the respective notches 26 in engagement with the latter and a plate end portion 14 or 19. Exterior angles 29 are secured to the members 22 and the cover plate 18. Upper and lower splice plates 30 lap the flanges 25 and 27 and are secured thereto. Thus the girder is tied in with the column, and the girder is reinforced at the juncture of the girder and the column.

The girders 20 are made of rolled steel heavier than that of the double girders 21 so that the girder strength on all sides of the column is equal for maximum stability with a minimum of material; and the girders 21 have a double use value.

It is to be understood that the present invention is not restricted to the details above described, but includes all constructions and modifications coming within the scope of the appended claims.

I claim:

1. In a joint for connecting a structural steel column and girders, a column having a web and flanges, a gusset plate disposed crosswise of said column coincident with the plane of its web and projecting laterally therefrom at opposite sides respectively, a girder having a web and flanges at each of said opposite sides of said column and whose web is in alignment with and abuts said gusset plate, notched channel members secured to said gusset plate at opposite sides respectively exteriorly of the column, and plates secured to the web of said girder at opposite sides respectively and projecting into respective notches in said notched channel members.

2. In a joint as set forth in claim 1, and upper and lower splice plates respectively secured to the upper and lower flanges of the notched channel members and the upper and lower flanges of said girder.

References Cited in the file of this patent

UNITED STATES PATENTS

985,035	Hotchkiss	Feb. 21, 1911
1,727,293	Larkin	Sept. 3, 1929
2,441,890	Larkin	May 18, 1948
2,641,829	Sasso	June 16, 1953