BUILDING CONSTRUCTION DETAILS.

No. XXX.

(Continued from page 182.)

THE CHICAGO AUDITORIUM.

PART I.—GENERAL DESCRIPTION AND ELLIPTICAL CEILING.

THE Auditorium Building, which was recently built in Chicago, is a vast pile of gray stone extending 362 feet on the north side of Congress Street from Michigan to Wabash Avenues, and extending on each avenue 187 feet. It includes altogether a content of 9,000,000 cubic feet. Its height from the sidewalk is not far from 150 feet, and high above that, on its south or Congress Street side, rises a rectangular tower 40 x 71 feet, no small building in itself, and containing on its upper floor accommodations for the local United States Signal Service Office considerably over 200 feet above the ground, while below are the offices of Adler & Sullivan, who designed and superintended the construction of the building. The east end and part of the south side is fitted up as a hotel, whose windows look over Lake Side Park upon Lake Michigan. The west end and the remainder of the south side is occupied by business offices, and in the remaining space in the center and north side of the building, but nowhere fronting on the street is the auditorium proper, from which the building takes its name. The following is a description of the roof of this portion of the building:

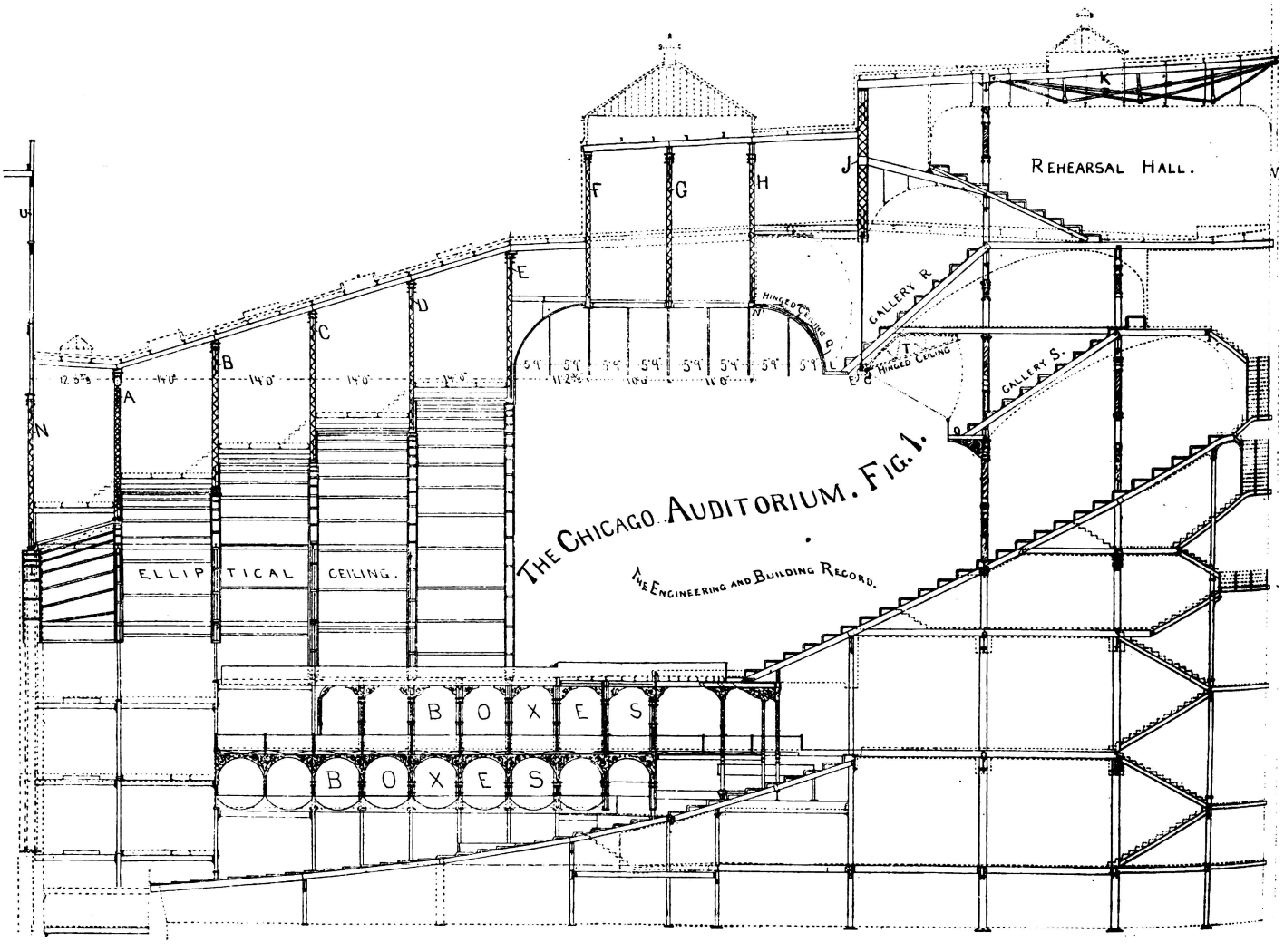
Figure 1 of the accompanying illustrations is a longitudinal section through the auditorium, and shows the main roof trusses A, B, C, D, E, F, G, H, J, and N in cross-section. The truss N is over the proscenium, U is a curtain wall between auditorium and the stores and offices, and V is a wall separating the auditorium and hotel. As the full capacity of the auditorium may not always be required the upper gallery R can be shut off by lowering the hinged ceiling Q as shown, and the audience space may be still further diminished by dropping the other hinged ceiling T and shutting off the gallery S also. These ceilings Q and T are decorated to correspond with the fixed ceilings, and when closed are continuous with it and unnoticeable, while they shut out the sight of empty seats, and are designed not to interfere with the acoustic properties of the main hall, whether they are open or shut.

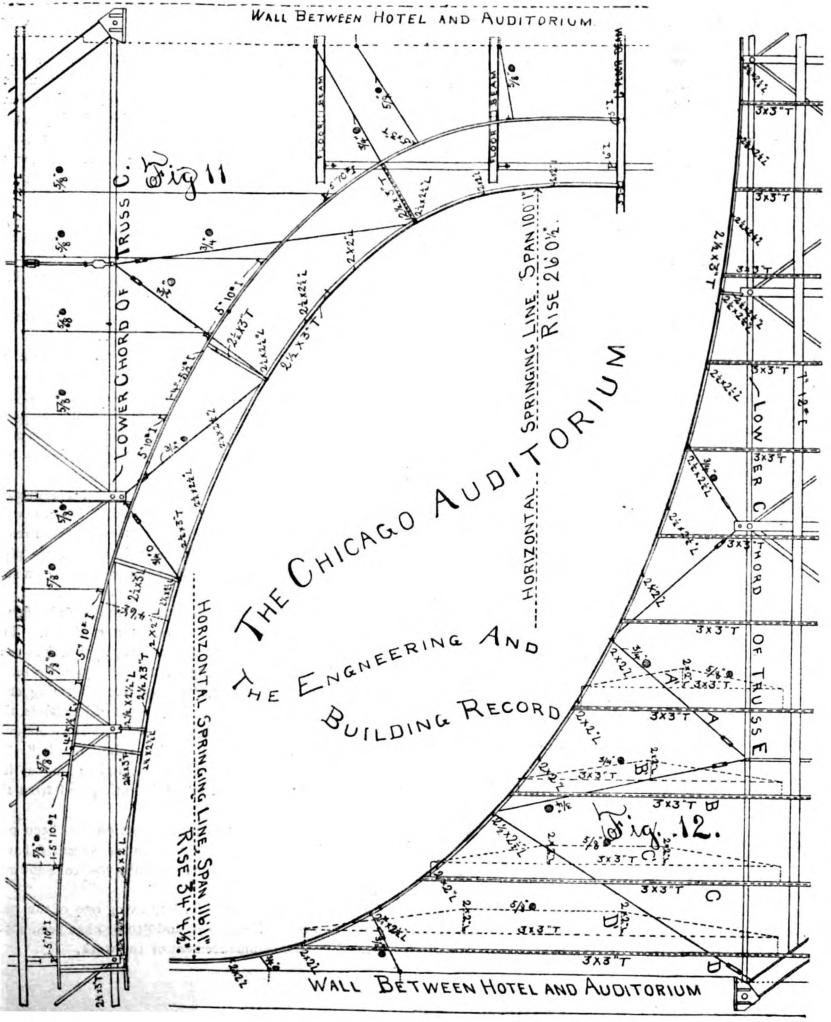
Figures 11 and 12 (shown at right angles to their natural positions for convenience of arrangement) are half sections through the auditorium in planes perpendicular to that of Fig. 1. They are simply diagrams to show the elliptical ceiling and the method of framing it and supporting it from the main trusses.

Details of connections similar to those of Fig. 11 will be illustrated in a succeeding article.

In Fig. 12 the vertical struts A, B, C and D are trussed in vertical planes perpendicular to the plane of view. A', B', C' and D' are material diagrams indicating this trussing for their respective struts.

(TO BE CONTINUED.)




Wall Between Hotel and Auditorium
Fig 11
Lower Chord of Truss C
Horizontal Springing Line, Span 100' 1"
Rise 26' 0½"
The Chicago Auditorium
The Engineering and Building Record
Horizontal Springing Line, Span 116' 11"
Rise 34' 4½"
Lower Chord of Trusse
Fig. 12.
Wall Between Hotel and Auditorium

BUILDING CONSTRUCTION DETAILS.

No. XXXIV.

(Continued from page 344 Vol XXI.

THE CHICAGO AUDITORIUM.

PART II.—MAIN ROOF TRUSSES.*

FIGURE 10 is a diagram of half of truss A (Fig. 1, page 296, Vol. XXI.) and its suspended ceiling, both of which are symmetrical about the center line Z' Z'.

Figure 2 shows details of the connections of Fig 10; X X is the floor line.

Figure 3 is a section and elevation at X X, Fig 2, and Fig. 4 is a section and elevation parallel to Z Z, Fig. 1.

Figure 5 is a section and elevation at Y Y, Fig. 1.

Figure 6 shows the connection at the foot of the curved frame C, and Fig. 7 is a section and elevation at V V, Fig. 6.

Figure 8 shows the connection of the frame C with the foot of suspender rod E, Fig. 1; and Fig. 9 is a section and elevation at Z Z, Fig. 8.

Figure 13 is an elevation showing details of the truss N, Fig. 1 (page 296, Vol. XXI.).

Figure 15 shows the connection of the sloping ceiling beams A A, etc., to the curved frame C.

Figure 14 is an elevation at X X, Fig. 15. The end of the beam A, though not in section, is blackened for greater distinctness.

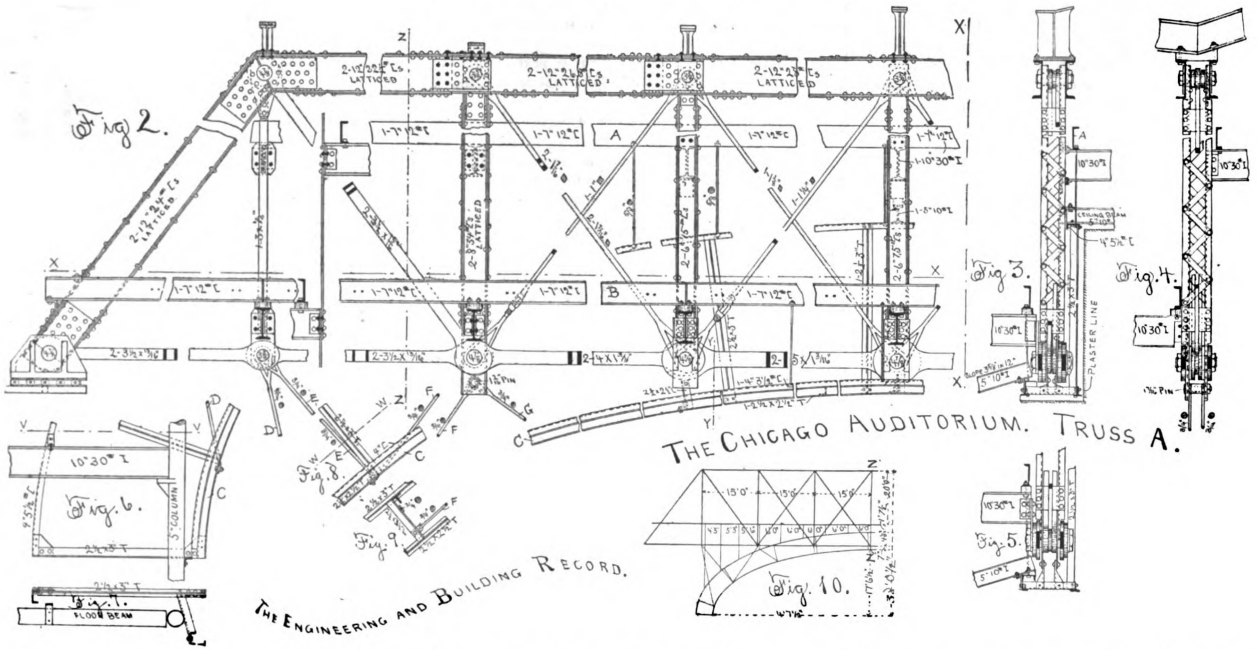


Figure 16 is a section and elevation at Z Z, Fig. 13.

Figure 17 is an enlarged section and elevation from Y Y, Fig. 13.

Figure 18 is an elevation of some of the connections of the truss J, Fig. 1 (page 296, Vol. XXI.).

There are eight panels in the truss, but the details shown here of the three end panels illustrate all the features of arrangement and construction.

Figure 19 is a section and elevation at Z Z, Fig. 18.

Figure 20 and 21 are in section and elevation from V V, Fig. 18.

Figure 22 shows the connection of the foot of the suspender B to the gallery girder E'.

(TO BE CONTINUED.)

BUILDING CONSTRUCTION DETAILS.

No. XXXV.

(Continued from page 394.)

THE CHICAGO AUDITORIUM.—PART III., HINGED CEILINGS.*

FIGURE 24 is a plan, to reduced scale, of the ceiling, which is raised and lowered in sections.

Figure 23 is a vertical section and elevation at Z Z, Fig. 24, and shows the arrangement of hinged ceiling T (Fig. 1, page 296, Vol. XXI.). The double girder E^1 is suspended from roof truss J by rods A, and to it are attached the hinges C C, etc., at intervals of about 15 feet, corresponding to the separate sections of the ceiling, which are revolved by hoisting chains at D D, etc. B and B are 10-inch lattice girders.

Figure 25 is a vertical section at elevation at Z Z, Fig. 26, and shows the arrangement of hinged ceiling Q, Fig. 1 (page 296, Vol. XXI.).

Figure 26 is an elevation from X X, Fig. 25, of part of the ceiling, which is symmetrical about the center line C C, and has a total length of 87 feet 2 inches.

Figure 27 shows the detail at hinge A, and Fig. 28 shows the pattern of single and double hinges.

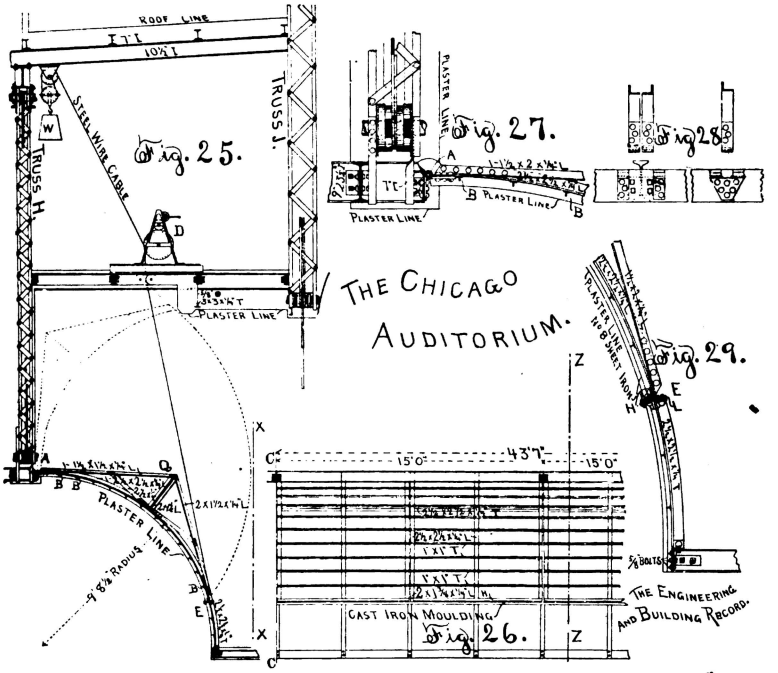
The ceiling is partly counterbalanced by weights W, and is hoisted and lowered by crabs D, each having a capacity three times as great as their estimated duty. B B, etc., are 1″x1″ tee bars, spaced 12 inches apart.

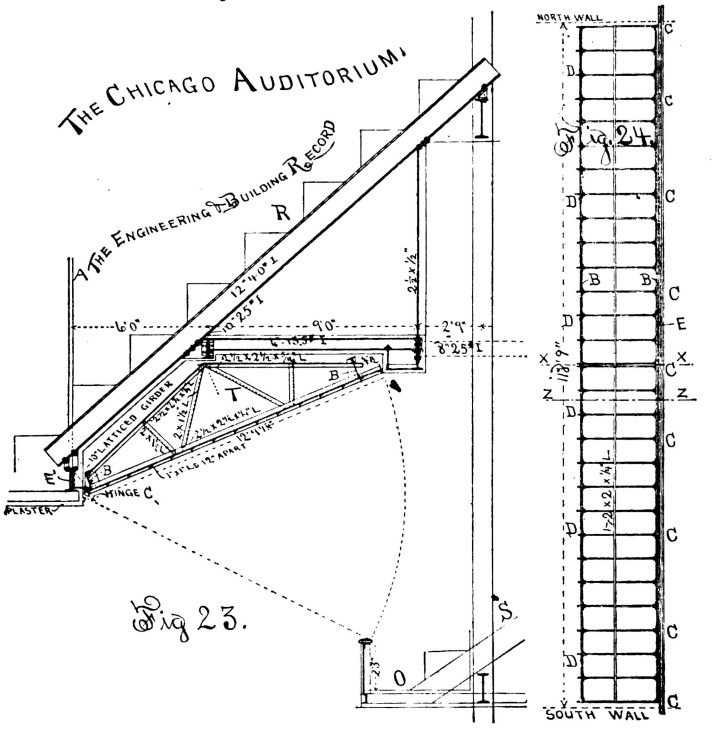
When closed the lower edge of this ceiling frame rests at E on the top of the rail in front of balcony R, Fig. 1.

Figure 29 shows the detail of the seat at E. H is a continuous longitudinal angle revolving against the cast-iron seat plate L.

(TO BE CONTINUED.)

*Part I., General Description and Elliptical Ceiling was published April 12; Part II., Main Roof Trusses, was published November 22.





BUILDING CONSTRUCTION DETAILS.

No. XLI.

(Continued from page 140.)

THE CHICAGO AUDITORIUM.

PART IV.—BEAM FRAMING.*

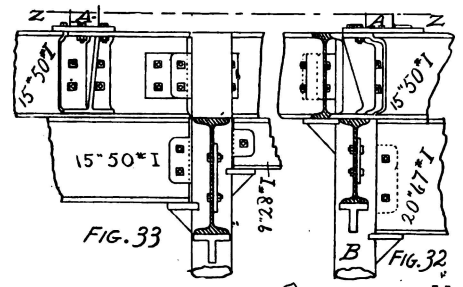
FIGURE 30 shows the connection details of the columns and cantilever beams which support the galleries R and S, Fig. 1, page 296, Vol. XXI., A and B are elevations from Z Z and X X, respectively.

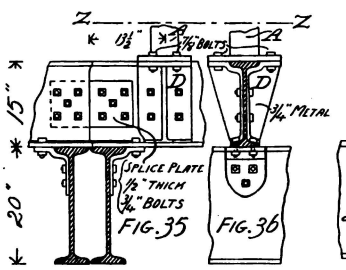
Figures 31 to 39, inclusive, show connections of the parquet beams and columns.

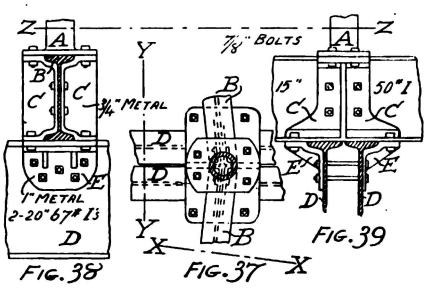
Figure 31 is a plan and section from Z Z, Figs. 32 and 33, showing the upper section A of a column nearly two feet eccentric from its lower section B.

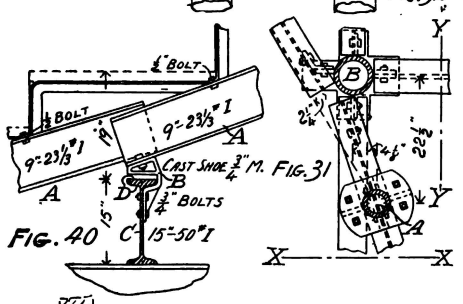
Figure 32 is an elevation from X X, and Fig. 33 is an elevation from Y Y, Fig. 31.

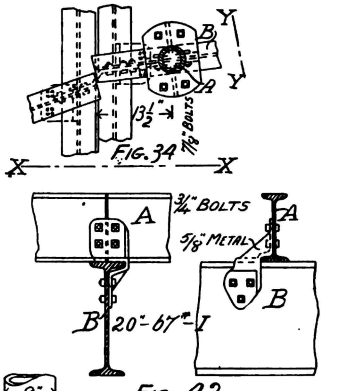
Figure 34 is a section and plan at Z Z of Figs. 35 and 36, showing the oblique splice at floor beams B B over girders C C and the cast-iron brackets D D, to connect column A to the full section of beam B.

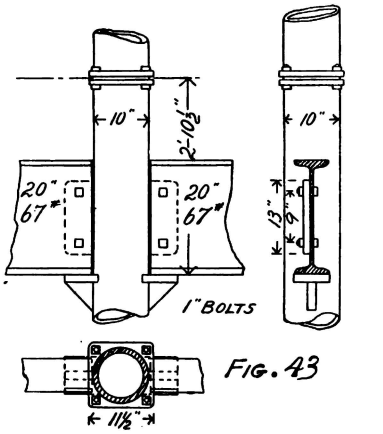


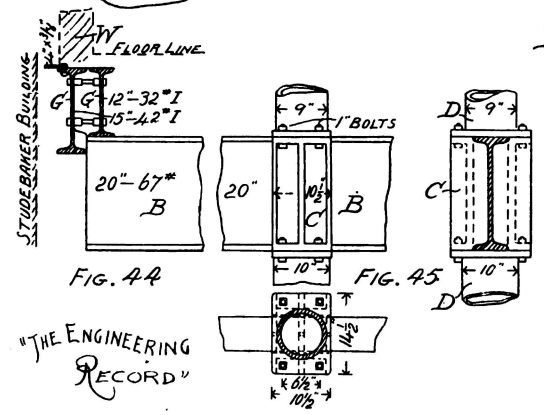












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Figures 37, 38 and 39 show the castings C C and E E for the support of column A, and splicing of oblique beams B B over the girders C C.

Figure 37 is a section and plan at Z Z of Figs. 38 and 39, the latter being, respectively, elevations from Y Y and X X, of Fig. 37.

Figure 40 shows the connection of gallery beams A A to girder C by cast-iron chair B, the open space D being filled by wrought-iron bearing wedges (not shown here). Figure 41 shows a web connection for supporting the gallery beams A A, at points where they intersect the girders B. Figure 42 shows the general method of connecting main floor beams A to girders B. Figure 43 shows a column and girder connection. Figure 44 shows the method of supporting, at every floor, a party wall W upon girders G G, which are carried by the cantilever beams B. Figure 45 shows the cast-iron box C, which forms a section of the column D and supports the cantilever frame B, which passes through, and is anchored to, another column at the end opposite that shown in Fig. 44.

(TO BE CONTINUED.)

*Part I., General Description and Elliptical Ceiling was published April 12, 1890.

Part II., Main Roof Trusses, was published November 22, 1890.

Part III., Hinged Ceilings, was published November 29, 1890.

BUILDING CONSTRUCTION DETAILS.
No. XLII.

(Continued from page 191.)

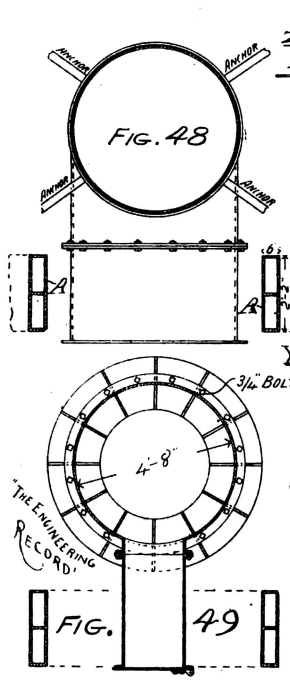
THE CHICAGO AUDITORIUM.

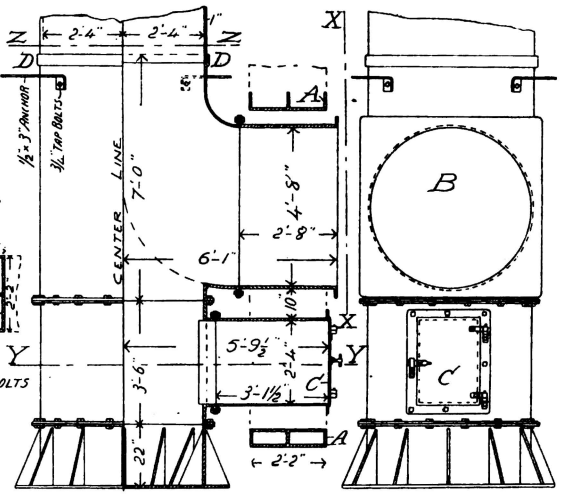
PART V.—A CAST-IRON SMOKE-STACK.*

SEVERAL tall stacks were required for this building and they were constructed of cast-iron and brick, as shown in Figs. 46 to 50, inclusive. These represent the general elevation and details of a stack on the east side of the court and illustrate the general features of all the stacks.

Figure 46 gives the general elevation and cross section, the iron pipe being shown in elevation and the brick walls in section. A A, etc., are 3 by ½-inch anchor bars, one end of which is top-bolted to the casting, and the other is hooked and built into the brick wall.

Figure 47 is an enlarged view of the foot of the stack, partly in section and partly in elevation. Figures 48 and 49 are sections at Z Z and Y Y, respectively, and Fig. 50 is an elevation at X X, of Fig. 47. A A etc., are cast-iron jambs; B is the main flue, and C is a soot door. The joints D D, etc., are lead calked.





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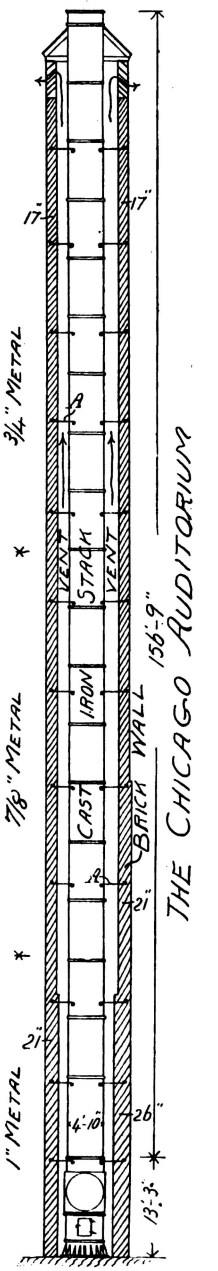

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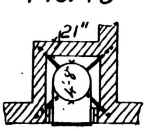

*Part I., General Description and Elliptical Ceilings, was published April 12, 1890.
Part II., Main Roof Trusses, was published November 22, 1890.
Part III., Hinged Ceilings, was published November 29, 1890.
Part IV., Beam Framing, was published February 14, 1891.

†Written for the State Board of Health of California by Rudolph Hering, civil and sanitary engineer, of New York.