Antiquated Structural Systems

Illustrated

Introduction:

This document, which only includes illustrations and names of different antiquated structural systems without any corresponding structural or technical information, has been developed for the following reason. It has been my experience that when you encounter an archaic system that you are not familiar with, the biggest initial hurdle you face is identifying the type or specific name of the system. Once you know the name of the system it is much easier to look for and research any available information on the same system. If you know of any additional systems not included in this compilation of illustrations please contact me so this document can be updated on a regular basis. I can also be contacted for requests concerning load tables and other data relating to the following illustrated systems.

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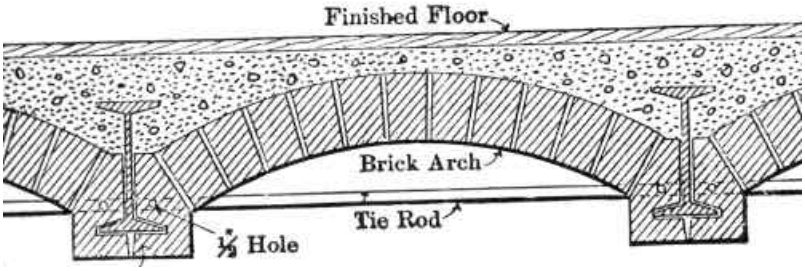
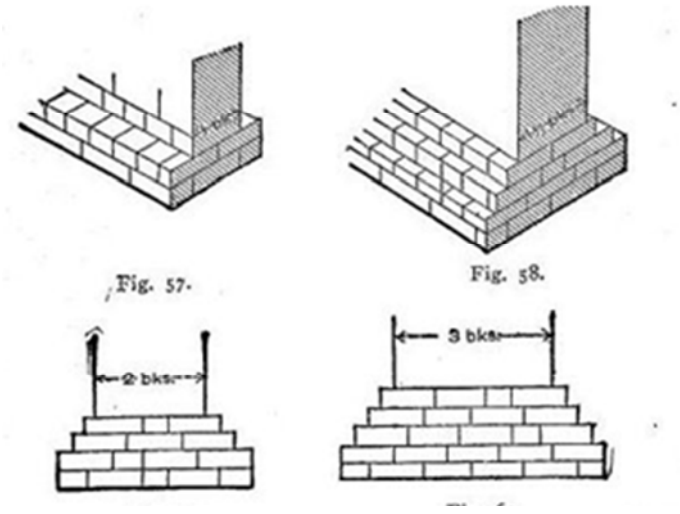
Brick Masonry:

- **Floor Arch** (Source: Kidder-Parker)



- **Footings** (Source: Building Construction and Superintendence)



- **Walls**
  - Façade (Source: Historic American Building Survey)

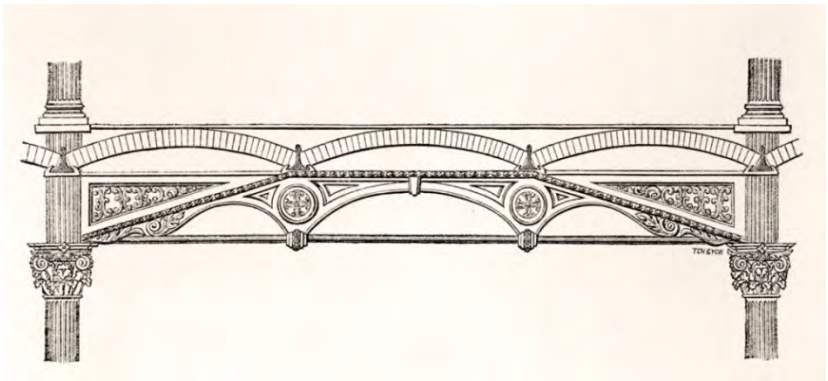
  - Loadbearing (Source: DMS)

Cast Iron:

- **Columns** (Source: DMS)

- **Composite Cast Iron and Wrought Iron**
  - Perforated Girder (Source: Historic American Building Survey)

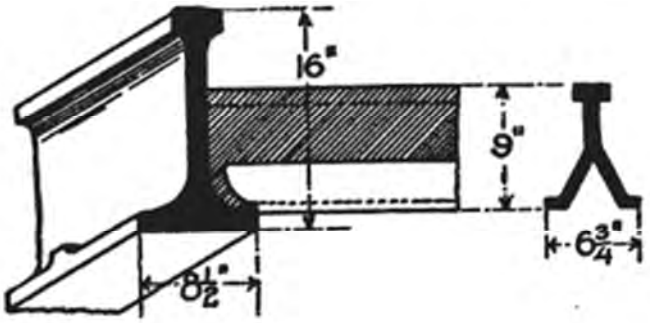
  - Truss (Source: Peabody Essex Museum)



- **Façade** (Source: DMS)

- **Lintels** (Source: DMS)

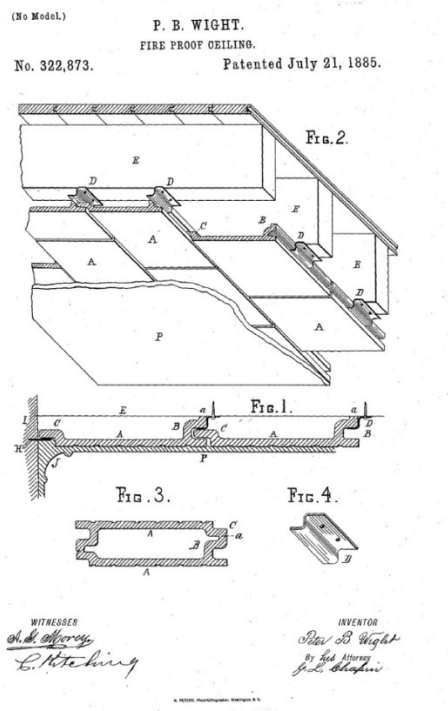
- **Y-Purlins and Inverted T Girders** (Source: Freitag)



<u>Cast Stone</u>: (Source: DMS)

<u>Clay-Tile</u>:

- **Ceiling Tile** (Source: U.S. Patent Office)


(No Model.)

P. B. WIGHT.

FIRE PROOF CEILING.

No. 322,873. Patented July 21, 1885.

FIG. 2.

FIG. 1.

FIG. 3.

FIG. 4.

WITNESSES

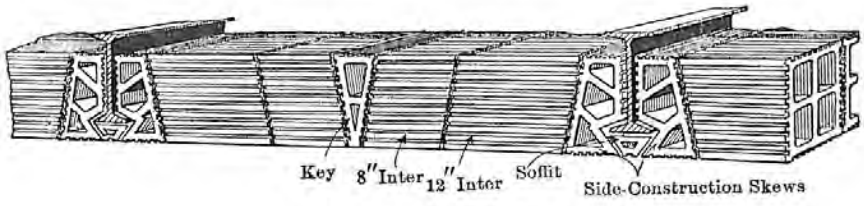
INVENTOR

Peter B. Wight

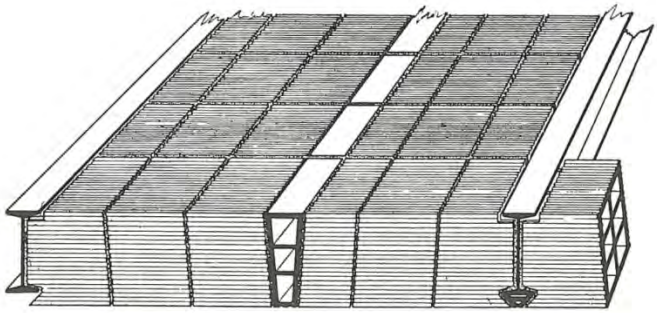
By his Attorney

J. L. Chapin

- **Flat Arch**
  - Combination Side and End Construction (Source: Kidder-Parker)



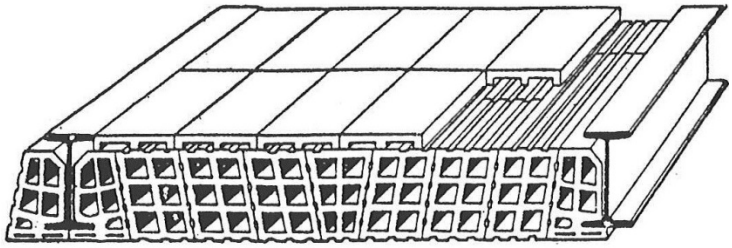
  - End Construction (Source: Tile Engineering Handbook)



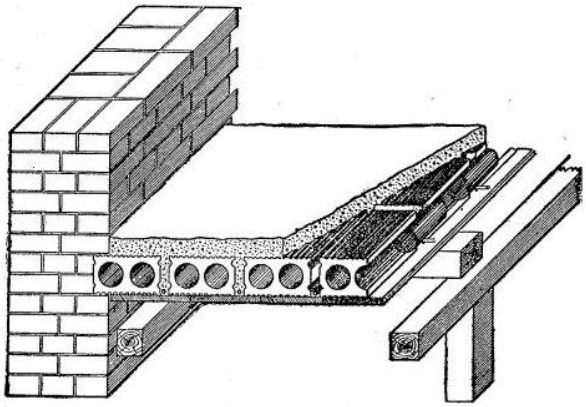
    - Acme
      (No Image Available)

    - Fawcett
      (No Image Available)

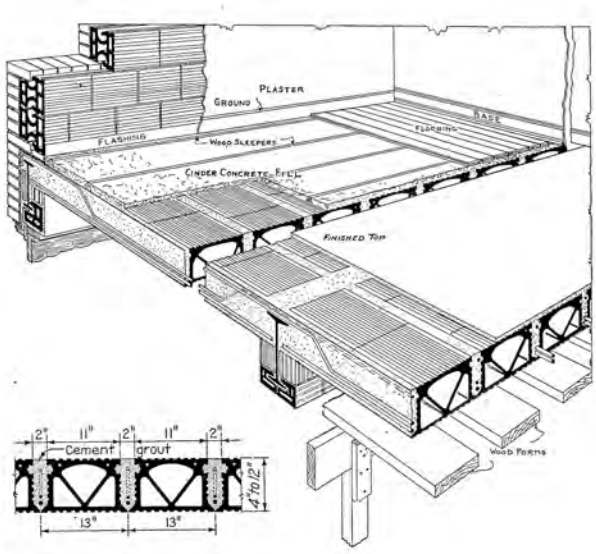
  - Side Construction (Source: Freitag)



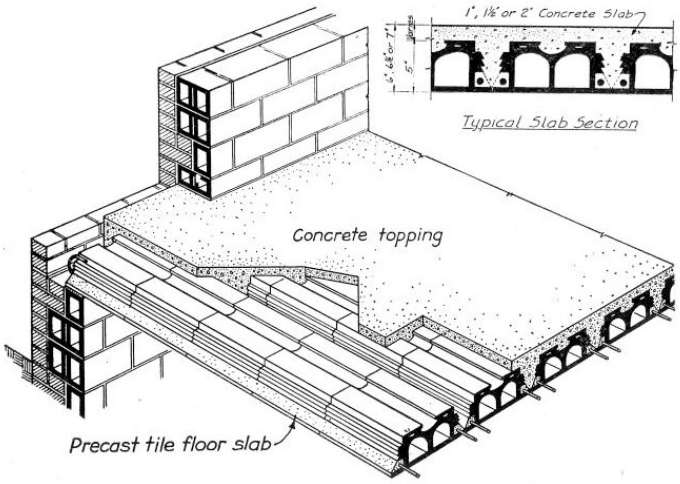
- **One-Way Joists**
  - Faber (Source: Building Construction and Superintendence)



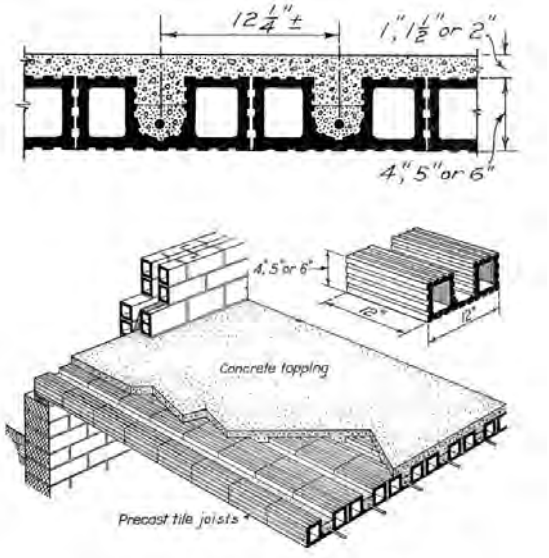
- Natcoflor (Source: Tile Engineering Handbook)



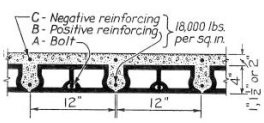
- Prefabricated
  - Adel Joistile (Source: Tile Engineering Handbook)



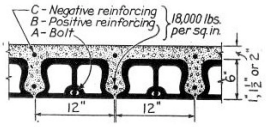
  - Joistile (Source: Tile Engineering Handbook)



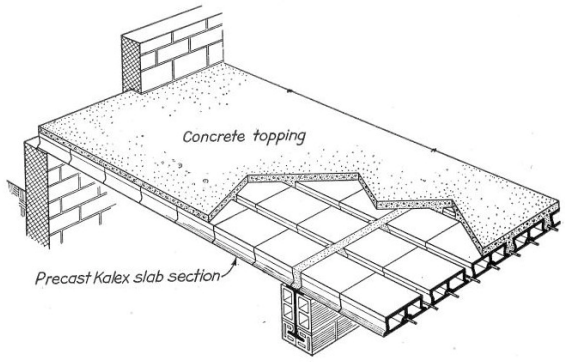
- Kalex (Source: Tile Engineering Handbook)



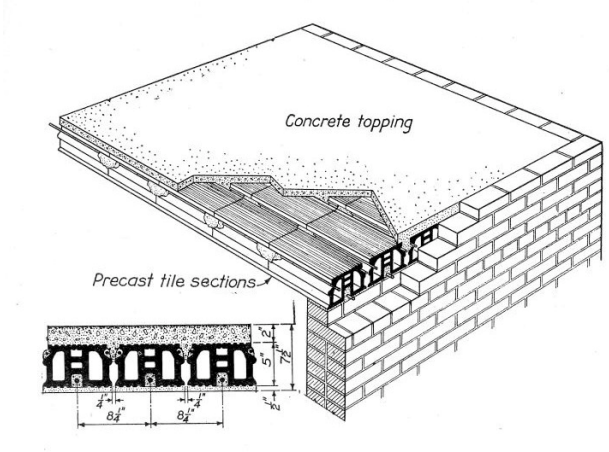
(a) 4-in. Kalex floor section.



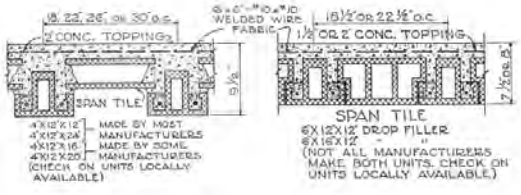
(b) 6-in. Kalex floor section.



- Sheffield (Source: Tile Engineering Handbook)

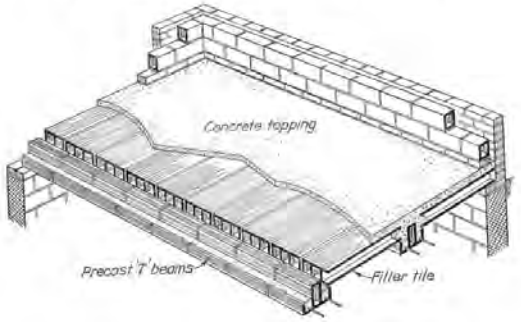


- T-Beam (Source: Tile Engineering Handbook)



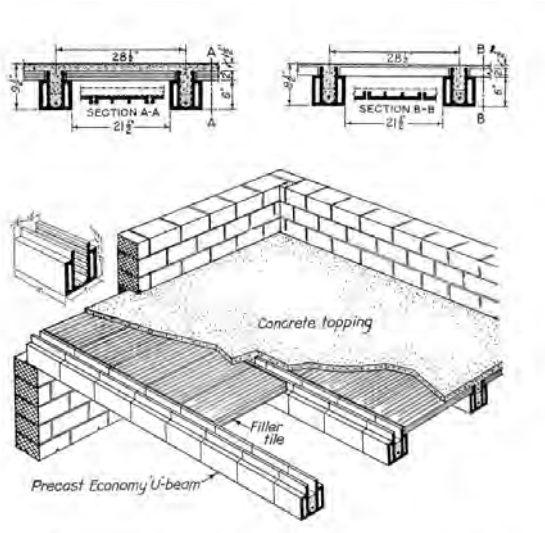
(a) Exposed beam ceiling.

(b) Flat ceiling.



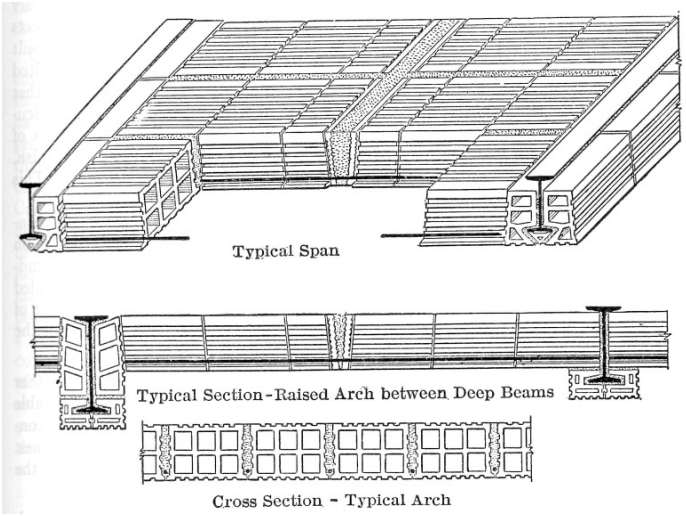
- Tilecrete
  (No Image Available)

- U-Beam (Source: Tile Engineering Handbook)

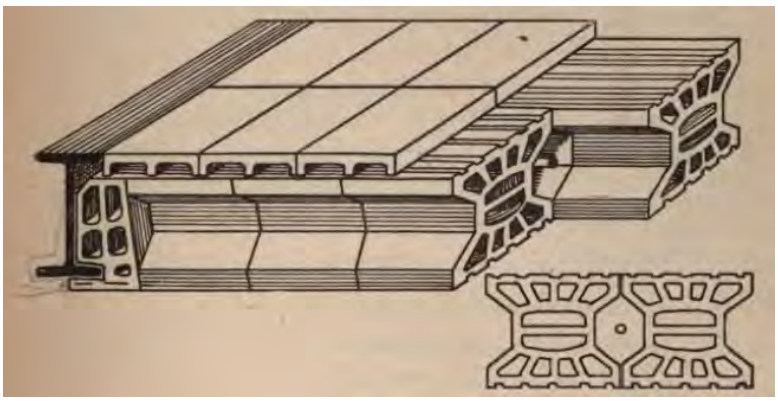


- United
  (No Image Available)

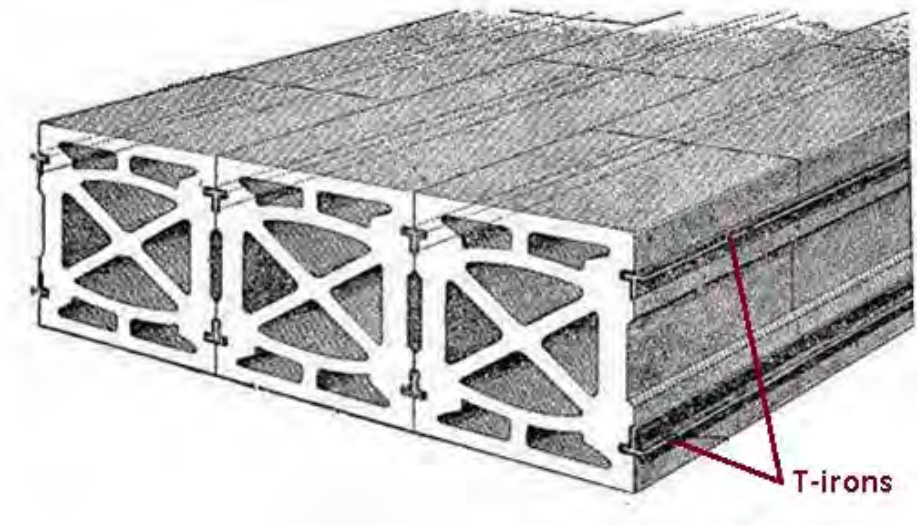
- **Reinforced Flat Arch** (Source: Kidder-Parker)



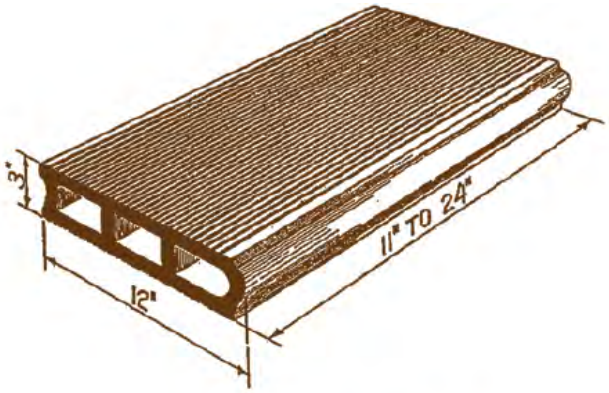
  - Excelsior (Source: Freitag)

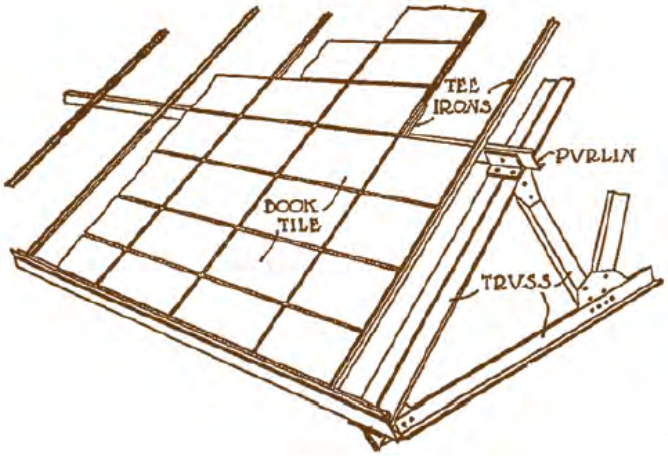


- Herculean (Source: Building Construction and Superintendence)



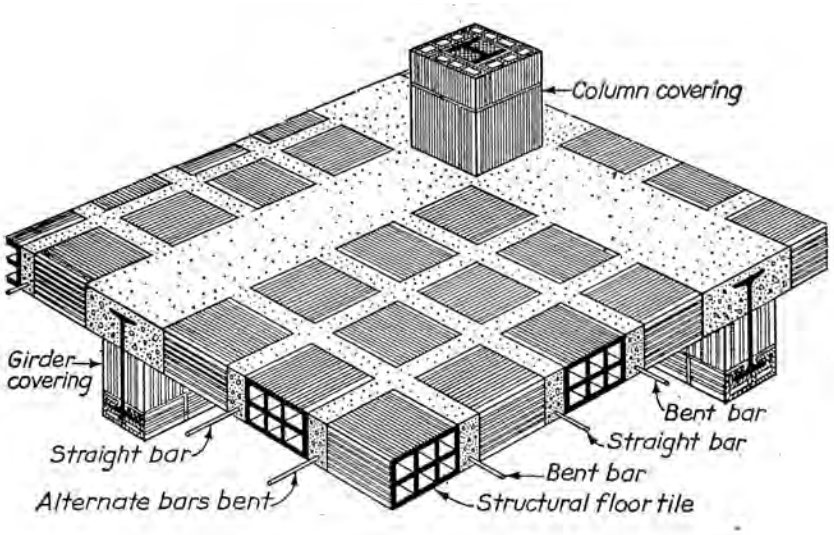
- **Roof Book Tile** (Source: Historic Preservation Education Foundation)





- Segmental Arch (Source: Tile Engineering Handbook)

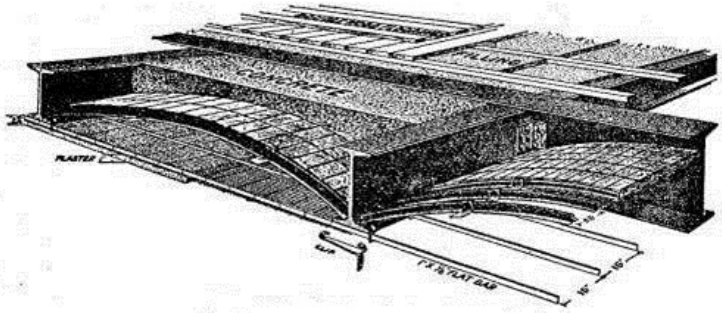
- **Two-Way Joists**
    - Sandberg
      (No Image Available)
    - Schuster (Source: Tile Engineering Handbook)



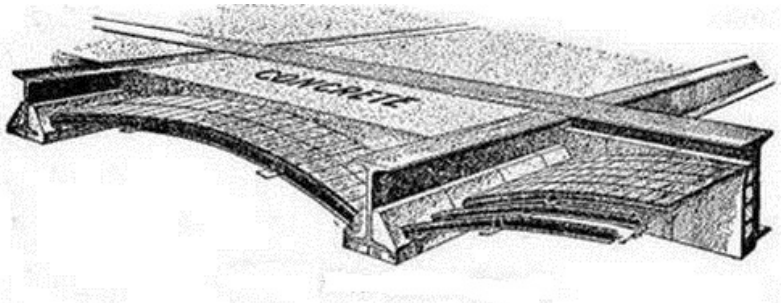
    - Smooth-Ceiling
      (No Image Available)

<u>Concrete</u>:

- **Arched**
    - Rapp
        - Arched (Source: Building Construction and Superintendence)



Type A



Type C

- Roebling
  - Arched (Source: Building Construction and Superintendence)

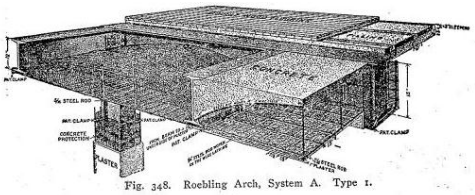


Fig. 348. Roebling Arch, System A. Type 1.

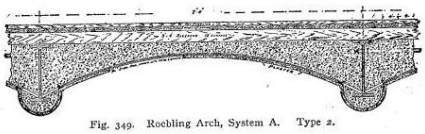


Fig. 349. Roebling Arch, System A. Type 2.

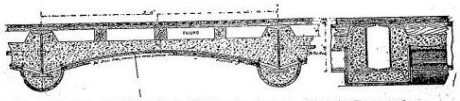


Fig. 350. Roebling Arch, System A. Type 2. Sleepers Depressed.

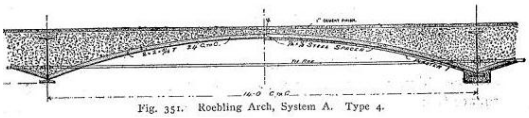
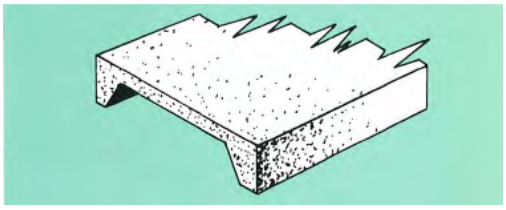


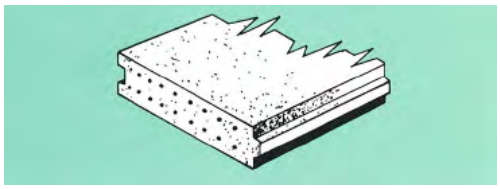
Fig. 351. Roebling Arch, System A. Type 4.

- **Beckwith Hollow Tile** (Source: Sara Wermiel)

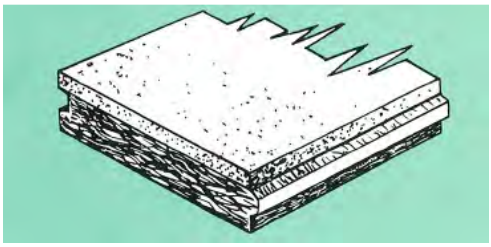
- **Cement-Wood Fiber**
  - Concrete Plank Company (Source: Concrete Plank Co.)
    - Channel Slabs



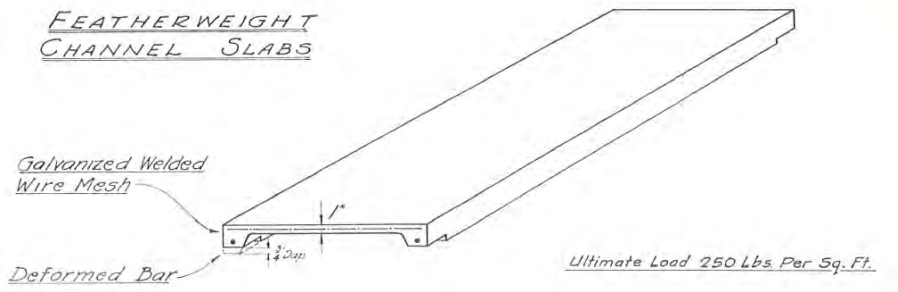
    - Concrete Plank



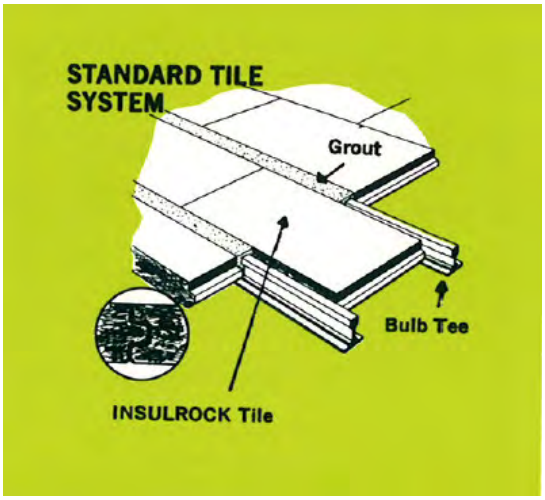
    - Porex Plank



  - Feather weight Flat Slab and Channel Slab (Source: Federal Cement Products)



  - Insulrock (Source: Flintkote Co.)



- PetriCal Deck (Source: Cornell Corporation)

- **Draped Mesh** (Source: DMS)

- Lock-Woven (Source: Building Construction and Superintendence)

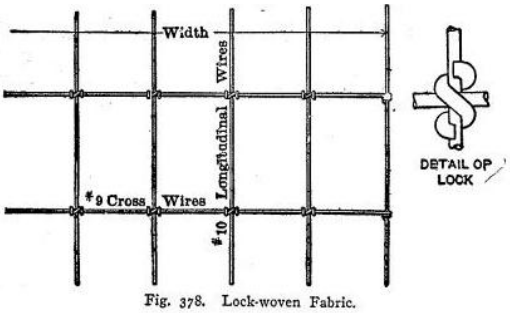


Fig. 378. Lock-woven Fabric.

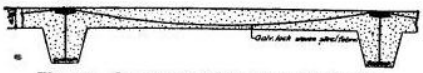
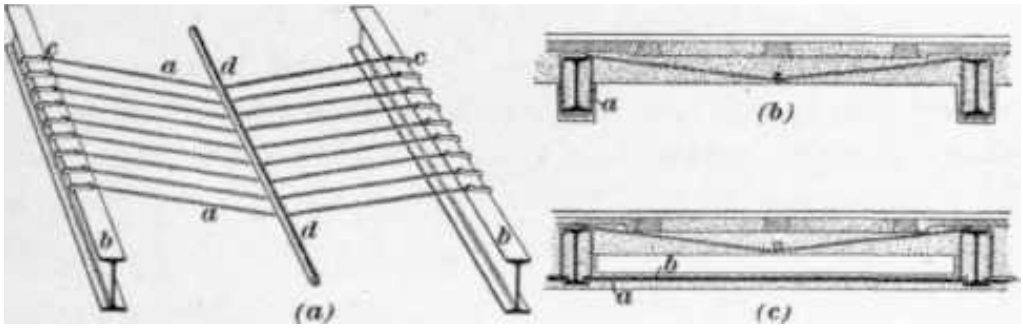
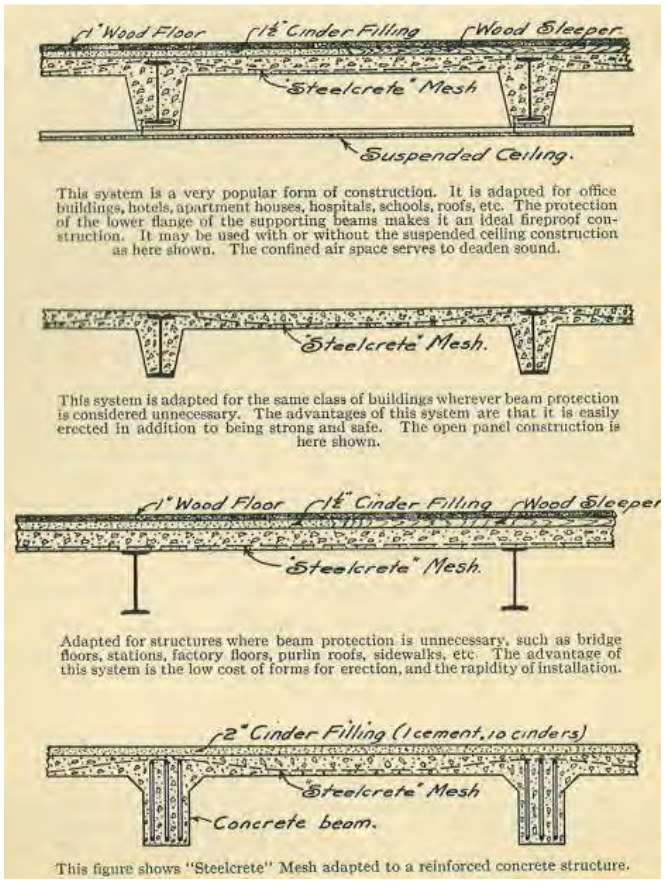


Fig. 379. Lock-woven Fabric Floor Construction.

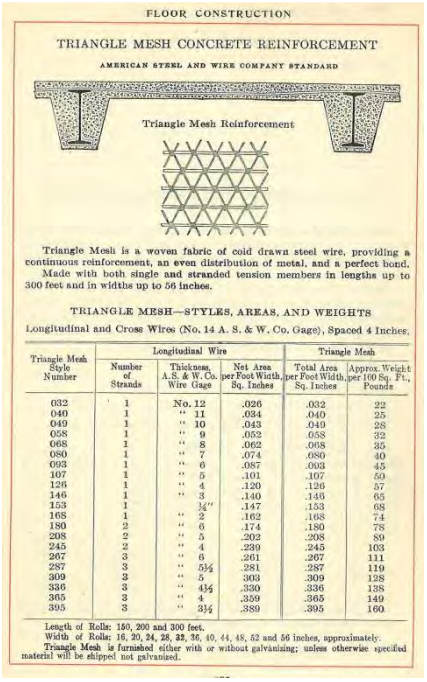
- Metropolitan (Source: A Treatise on Architecture and Building Construction, Volume 2)



- Steelcrete (Source: Building Construction and Superintendence)



- Triangle (Source: Building Construction and Superintendence)



FLOOR CONSTRUCTION

TRIANGLE MESH CONCRETE REINFORCEMENT

AMERICAN STEEL AND WIRE COMPANY STANDARD

Triangle Mesh Reinforcement

Triangle Mesh is a woven fabric of cold drawn steel wire, providing a continuous reinforcement, an even distribution of metal, and a perfect bond. Made with both single and stranded tension members in lengths up to 300 feet and in widths up to 56 inches.

TRIANGLE MESH—STYLES, AREAS, AND WEIGHTS

Longitudinal and Cross Wires (No. 14 A. S. & W. Co. Gage), Spaced 4 Inches.

Triangle Mesh Style Number	Longitudinal Wire			Triangle Mesh	
	Number of Strands	Thickness, A.S. & W. Co. Wire Gage	Net Area per Foot Width, Sq. Inches	Total Area per Foot Width, Sq. Inches	Approx. Weight per 100 Sq. Ft., Pounds
032	1	No. 12	.026	.032	22
040	1	" 11	.034	.040	25
049	1	" 10	.043	.049	28
058	1	" 9	.052	.058	32
068	1	" 8	.062	.068	35
080	1	" 7	.074	.080	40
093	1	" 6	.087	.093	45
107	1	" 5	.101	.107	50
126	1	" 4	.120	.126	57
146	1	" 3	.140	.146	65
153	1	¼"	.147	.153	68
168	1	" 2	.162	.168	74
180	2	" 6	.174	.180	78
208	2	" 5	.202	.208	89
245	2	" 4	.239	.245	103
267	3	" 6	.261	.267	111
287	3	" 5½	.281	.287	119
309	3	" 5	.303	.309	128
336	3	" 4½	.330	.336	138
365	3	" 4	.359	.365	149
395	3	" 3½	.389	.395	160

Length of Rolls: 150, 200 and 300 feet.
Width of Rolls: 16, 20, 24, 28, 32, 36, 40, 44, 48, 52 and 56 inches, approximately.
Triangle Mesh is furnished either with or without galvanizing; unless otherwise specified material will be shipped not galvanized.

- White Concrete (Source: Building Construction and Superintendence)

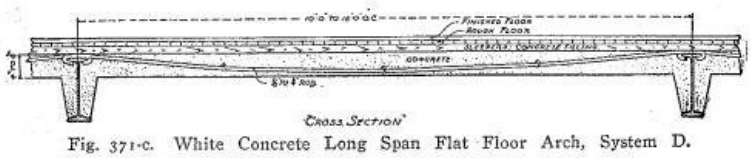


Fig. 371-c. White Concrete Long Span Flat Floor Arch, System D.

- **Flat Plate/Slab Construction**
  - Four-Way (Source: CRSI)

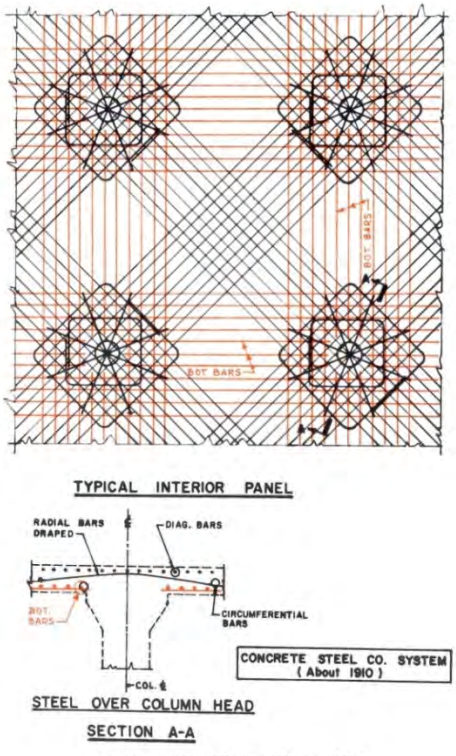
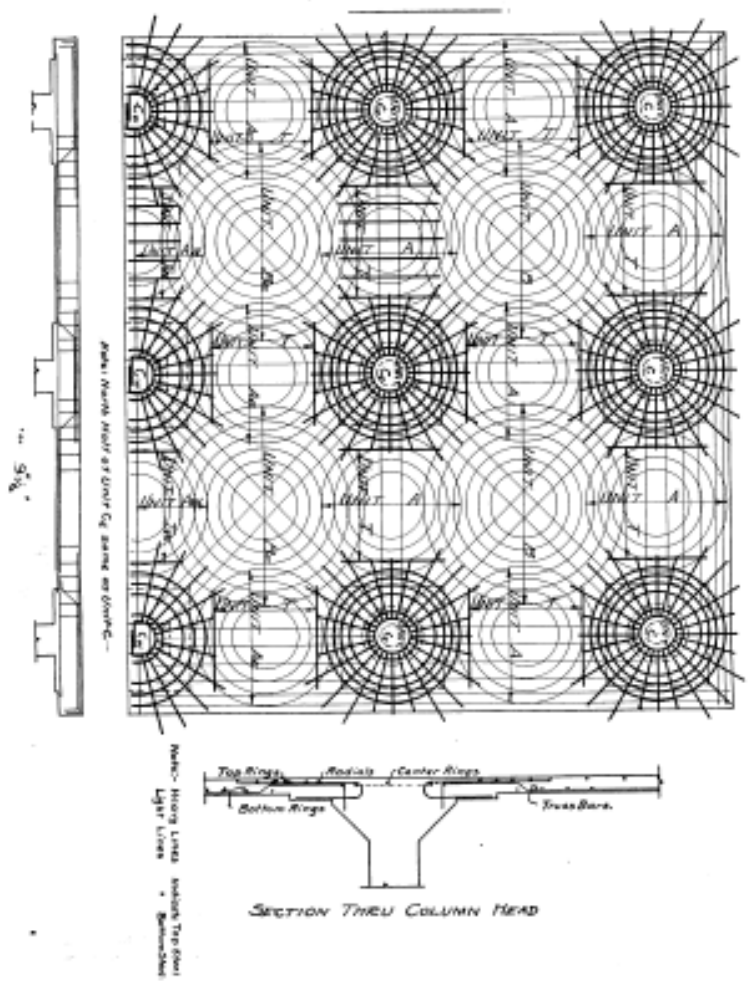
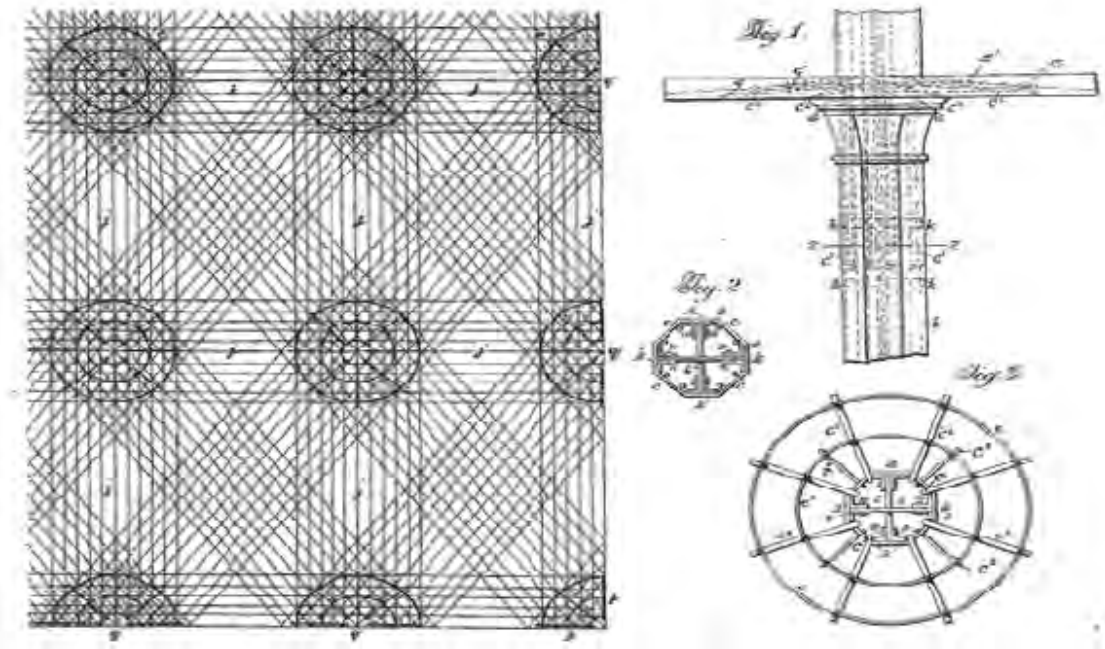


Fig. 4. Concrete Steel ("Cantilever") System (4-Way)

- S.M.I. System (Source: ACI)

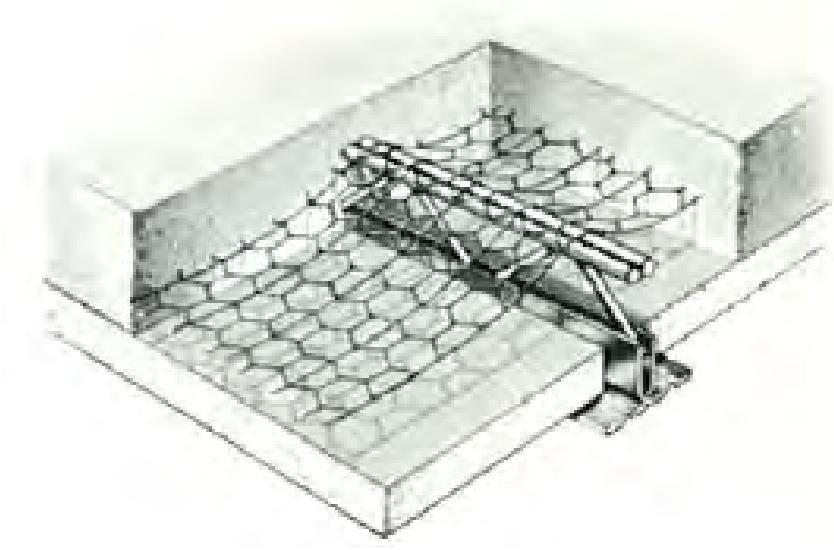


- Turner Mushroom System (Source: Meghan Elliott)



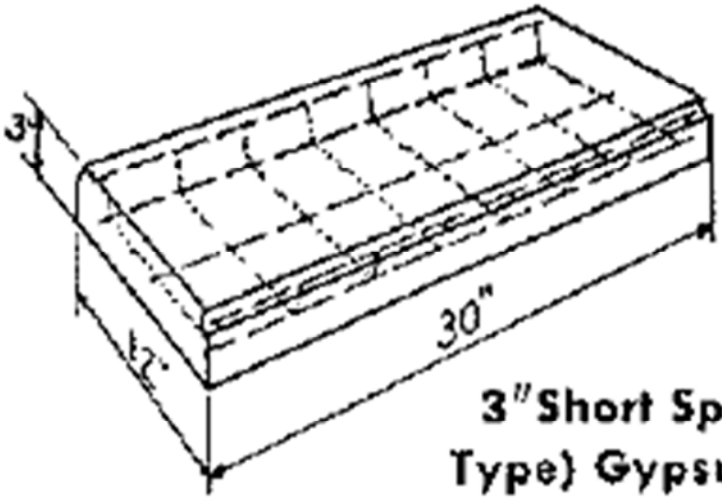
- Two-Way
  (No Image Available)

- **Gypsum Concrete**
  - Keydeck Truss Tees (Source: U.S. Gypsum Co.)



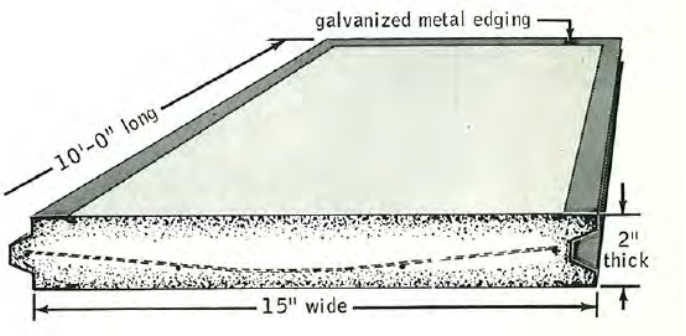
  - United States Gypsum
    - Floor Plank; with metal edge (Source: U.S. Gypsum Co.)

    - Gypsum Roof Tile (Source: U.S. Gypsum Co.)

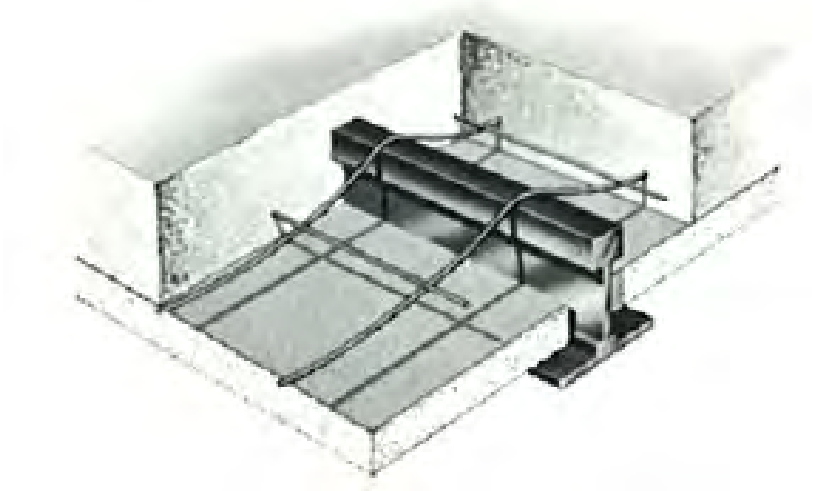


3"Short Span (Nailing Type) Gypsum Roof Tile

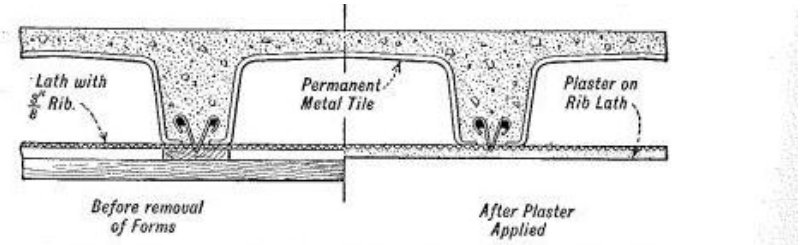
- Metal Edge Plank (Source: U.S. Gypsum Co.)



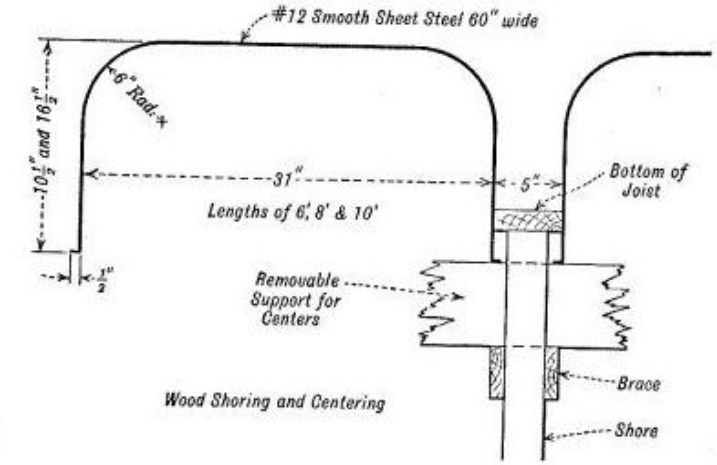
- Poured Gypsum Roof Deck; on formboard (Source: U.S. Gypsum Co.)



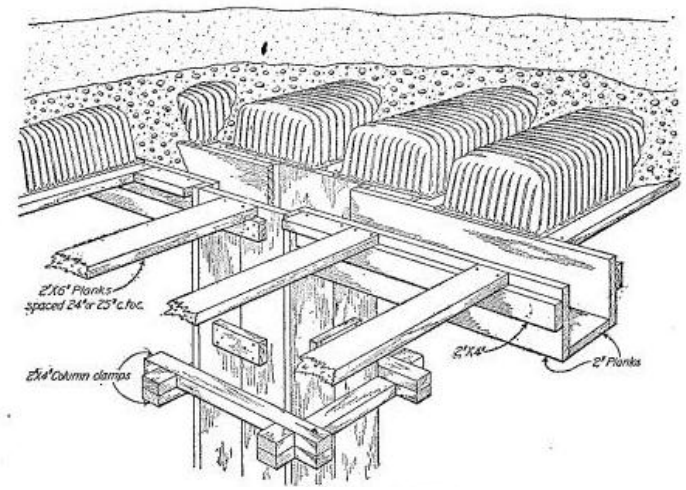
- **Metal Tile** (Source: Building Construction and Superintendence)



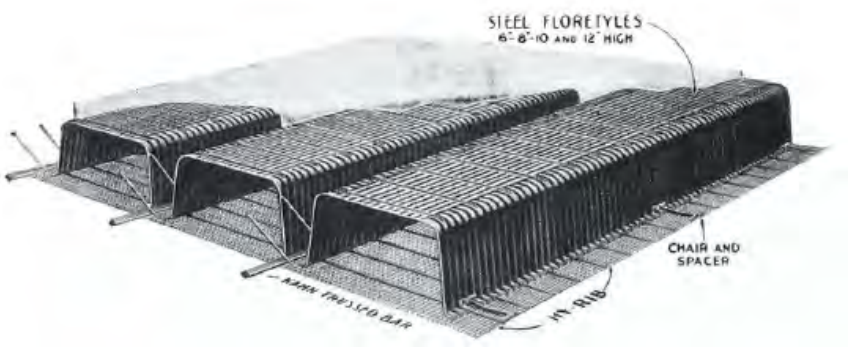
  - Adjustable (Source: Building Construction and Superintendence)



- GF (Concrete Engineers Handbook)



- Truscon Ribbed Floretyle; permanent, and Floreform; removable (Source: Truscon Buildings Co.)



- **One-Way Slab**
  - Columbian (Source: Building Construction and Superintendence)

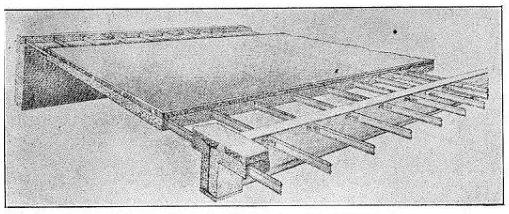


Fig. 360. Columbian System. Long Span. System B.

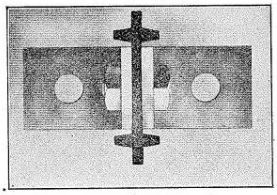


Fig. 361. Columbian System. Angle-bolt Connection.

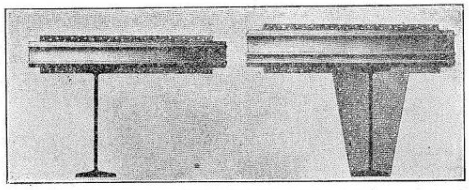
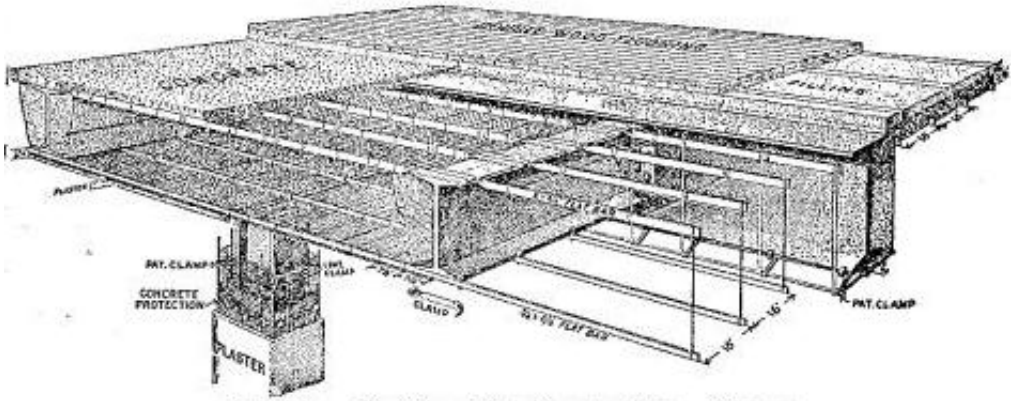


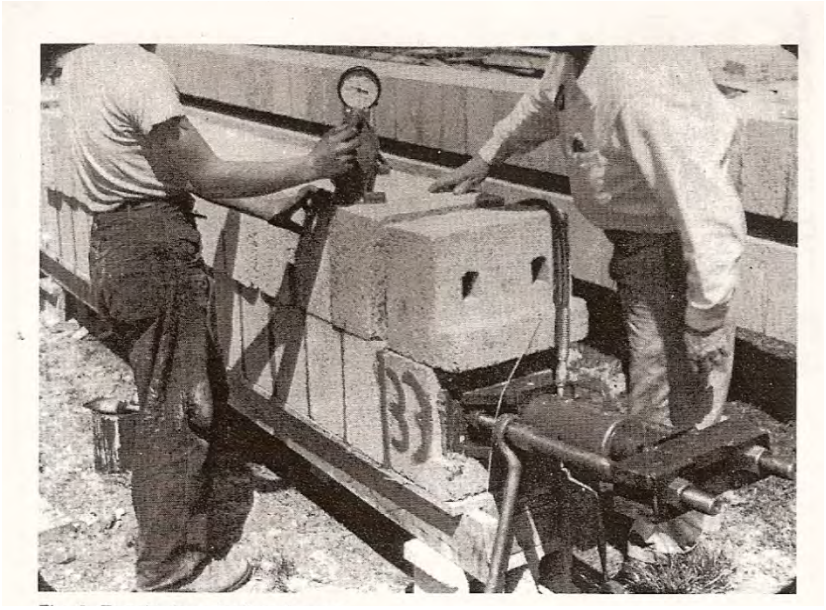
Fig. 362. Columbian System. Long Span. System C.

- Roebling Flat (Source: Building Construction and Superintendence)

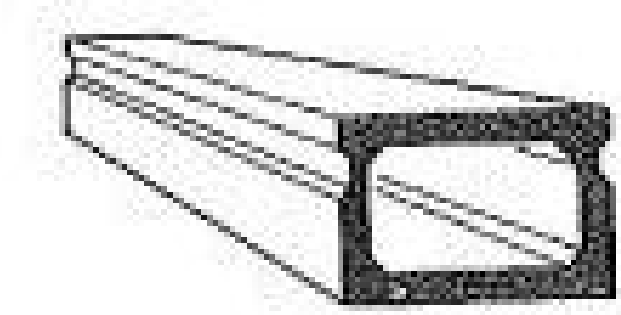


- Thompson Floor
  (No Image Available)

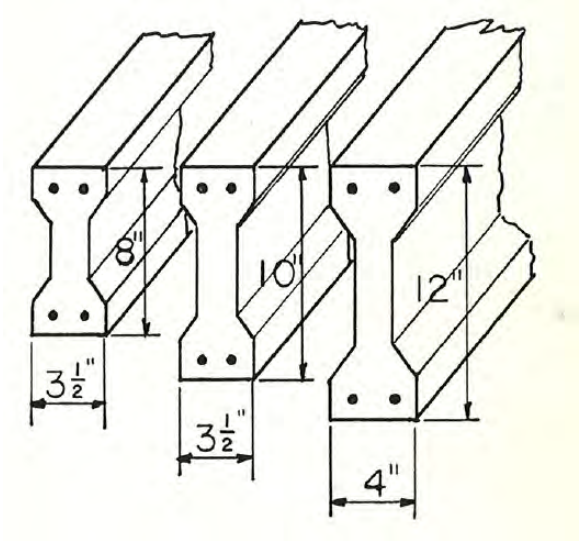
- **Post-Tensioned**
  - Breeko Block Beam (Source: Ross Bryan Associates)



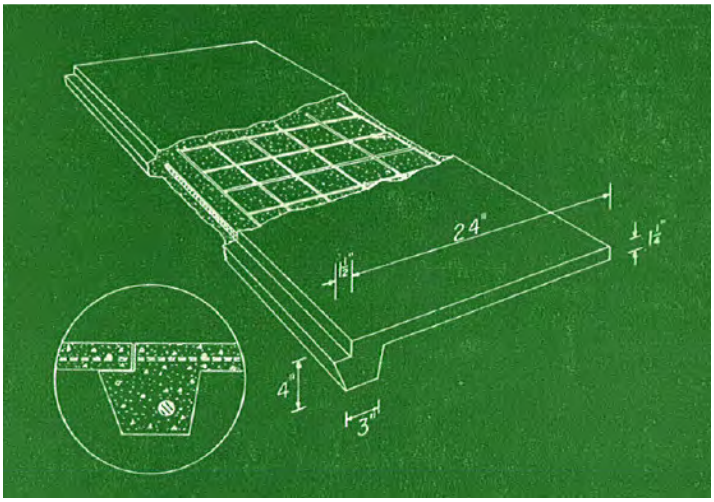
- **Precast**
  - Box Beam (Source: Modern Prestressed Concrete)



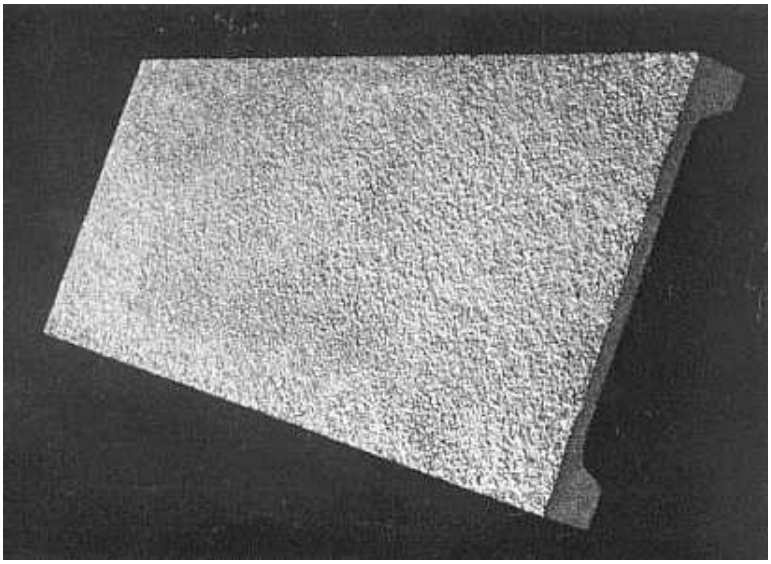
- Cantilite
  - Concrete Joist (Source: Concrete Plank Co.)



  - Lap-Plank (Source: Concrete Plank Co.)

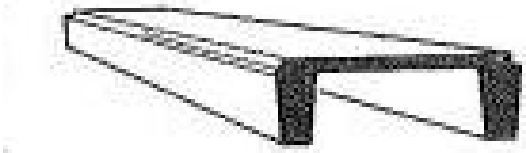


- Channel Slab (Source: Mid Con Products)



- Double Tee (Source: OSCO Construction Company)

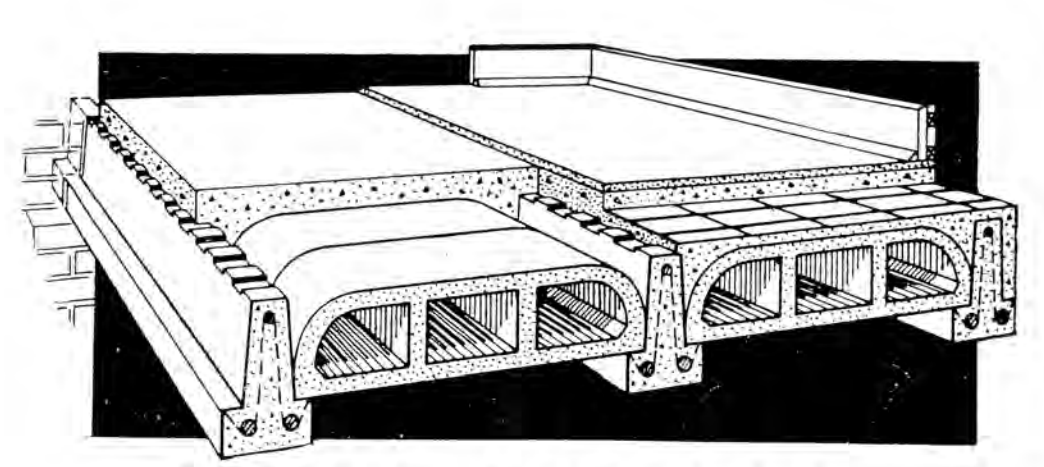
  - Channel Tee (Source: Modern Prestressed Concrete)



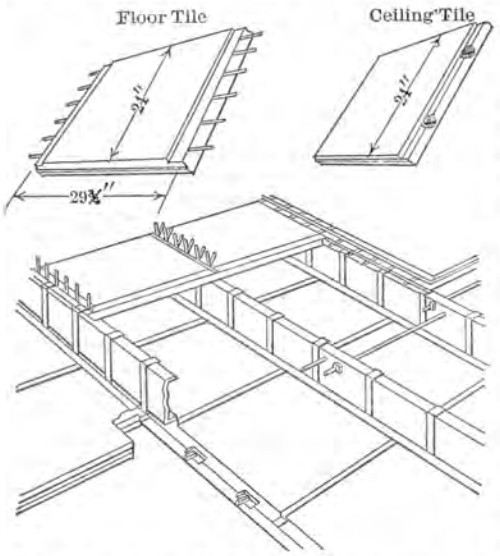
  - Monowing (Source: Modern Prestressed Concrete)

- Earley Process (polychrome, architectural mosaic concrete)
  (No Image Available)

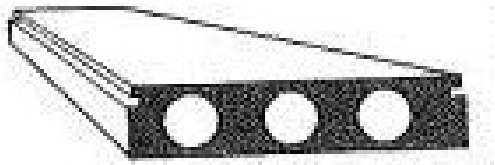
- F&A (Source: Nitterhouse Precast Concrete)



- Gypsteel (Source: Kidder-Parker)

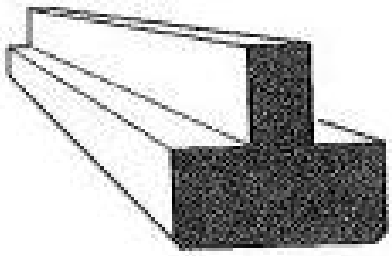


- Hollowcore Plank (Source: Modern Prestressed Concrete)

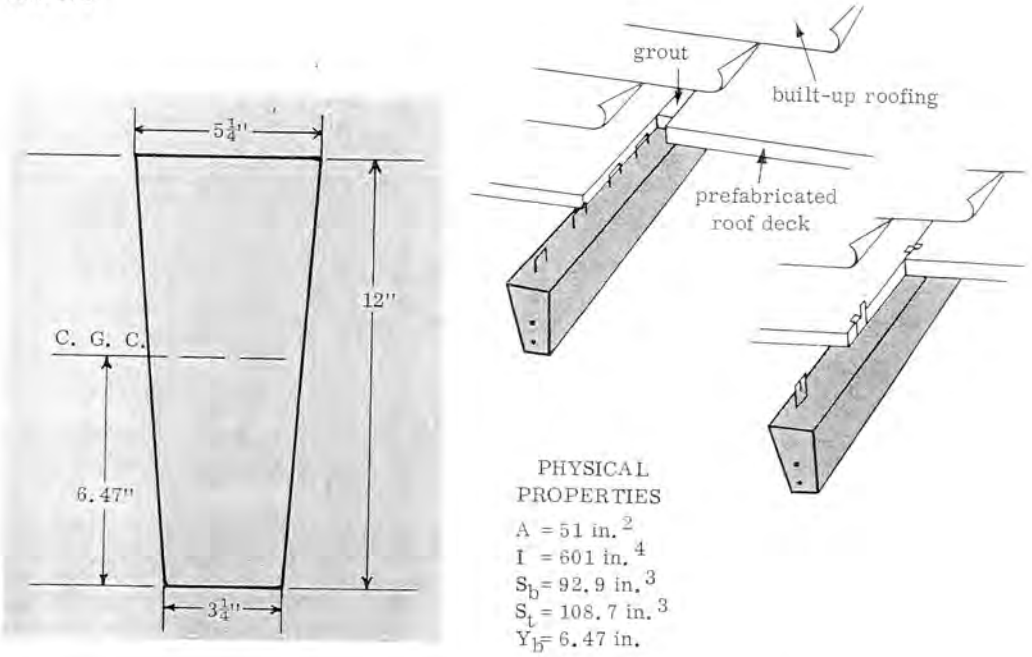


- I-Beam (Source: Modern Prestressed Concrete)

- Inverted Tee Beam (Source: Modern Prestressed Concrete)

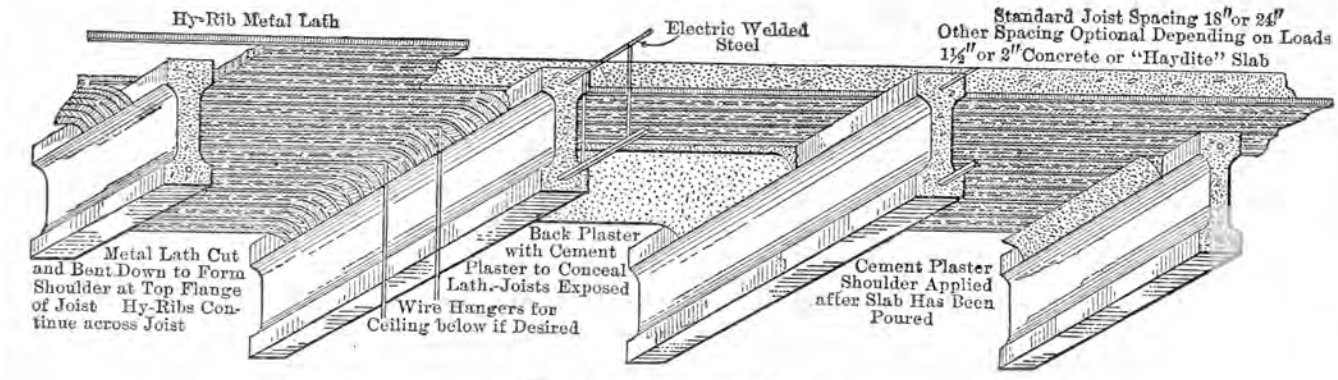


- Keystone Joist (Source: Nitterhouse Precast Concrete)

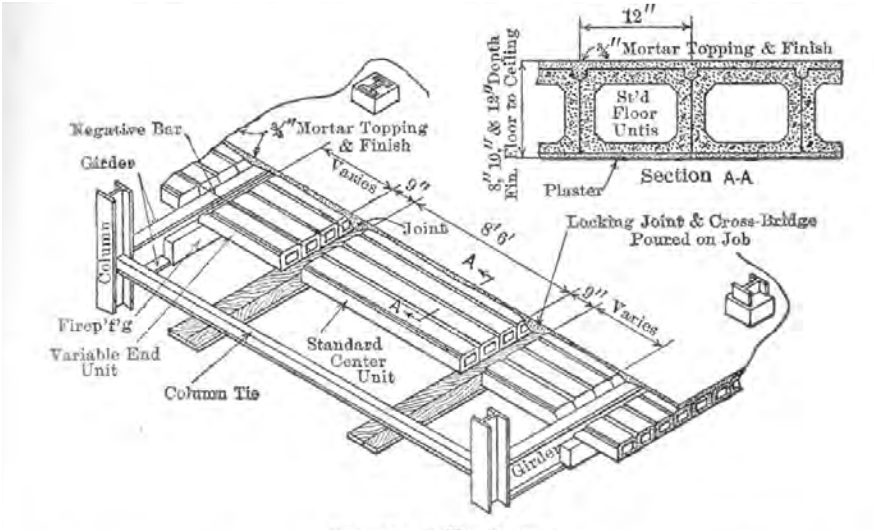


- Kurtz I-Joists (Source: Kurtz Precast Corporation)

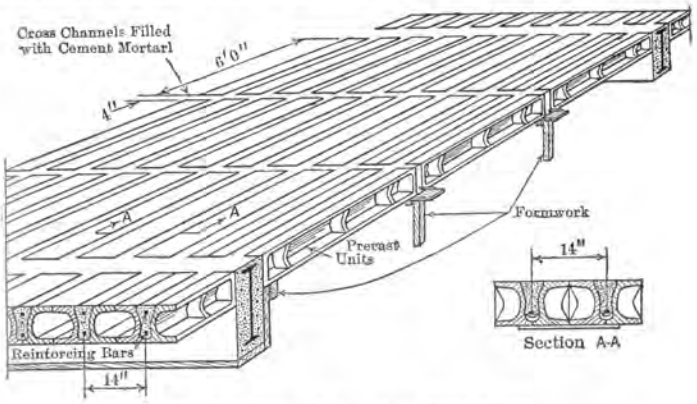
- Lith-I-Bar (Source: Kidder-Parker)



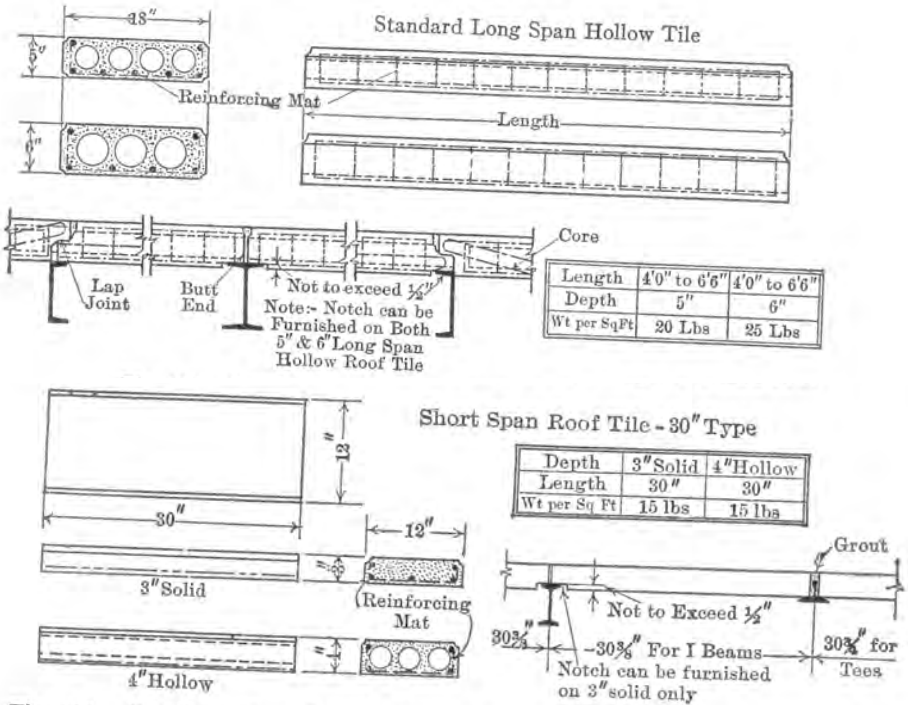
- Miller (Source: Kidder-Parker)



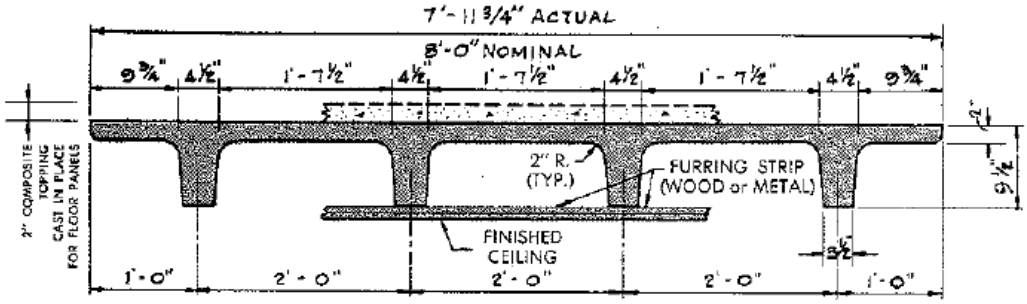
- Porete (Source: Kidder-Parker)



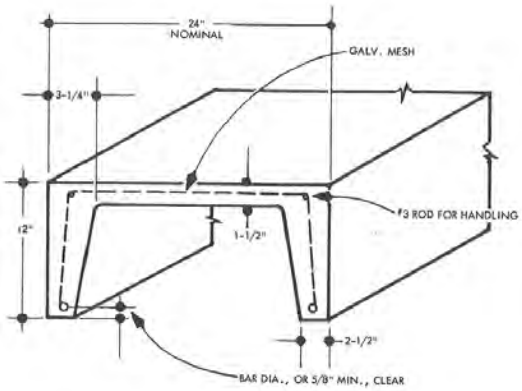
- Pyrobar (Source: Kidder-Parker)



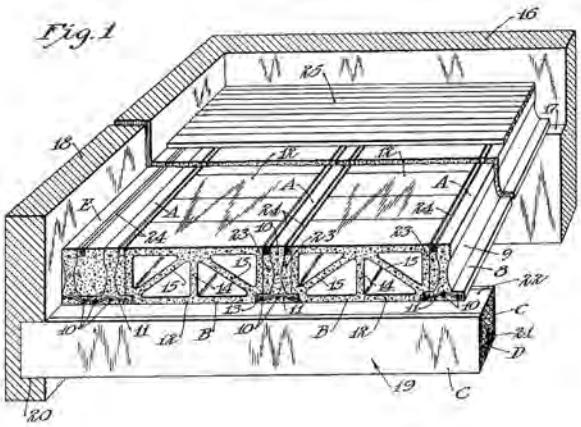
- Quad Tee (Source: Oldcastle Precast)

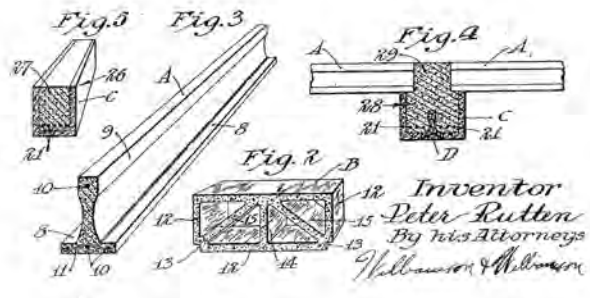


- Rackle Precast
  - Channels (Source: George Rackle & Sons, Co.)

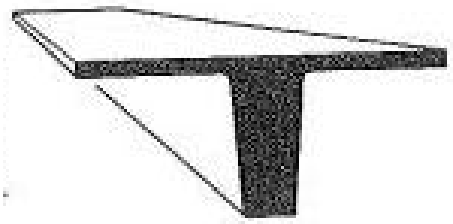


- Rutten (Source: U.S. Patent Office)

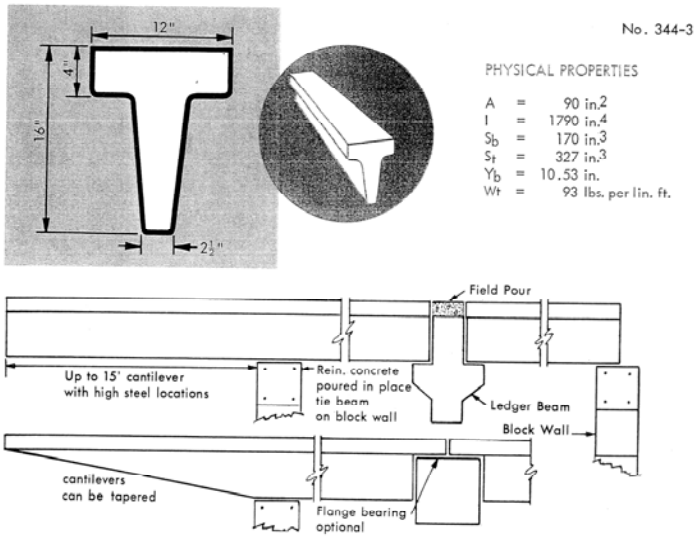




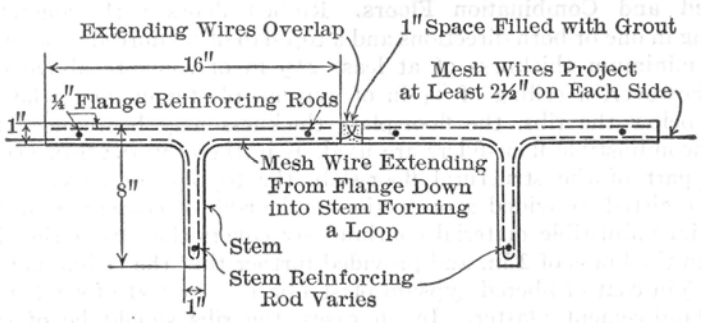
- Single Tee (Source: Modern Prestressed Concrete)



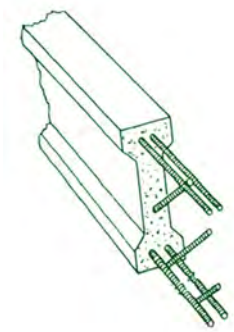
- Tee Joist (Source: Nitterhouse Precast Concrete)



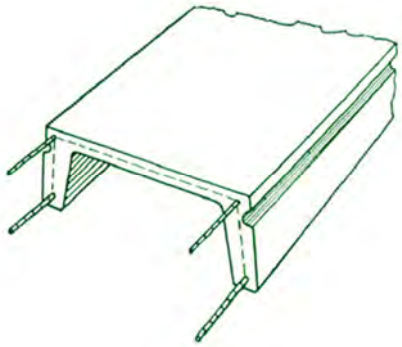
- Tee Stone (Source: Kidder-Parker)



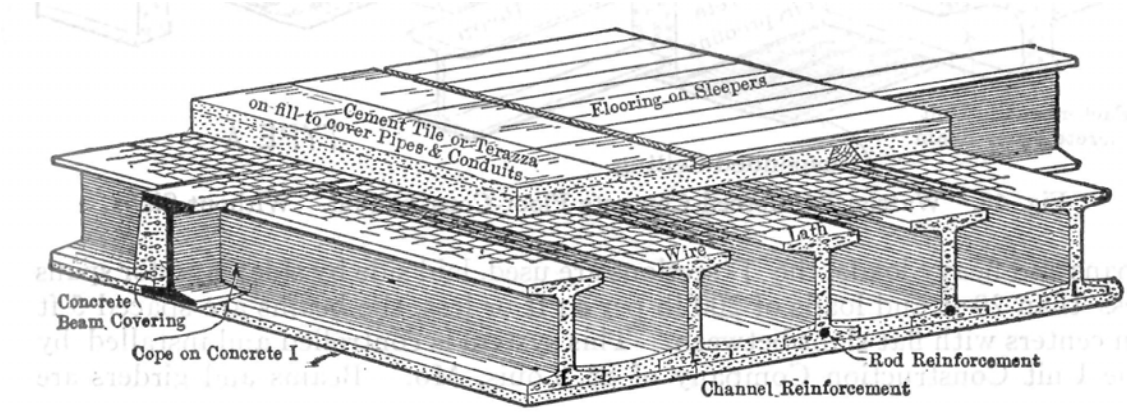
- Twin-Bar
  - I-Joist (Source: Structural Precast Company)



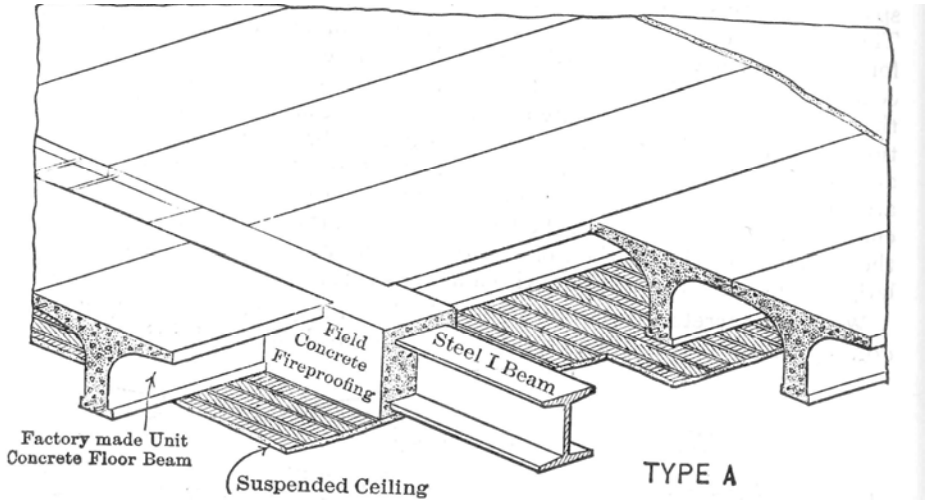
- Longspan Channel Slab (Source: Structural Precast Company)

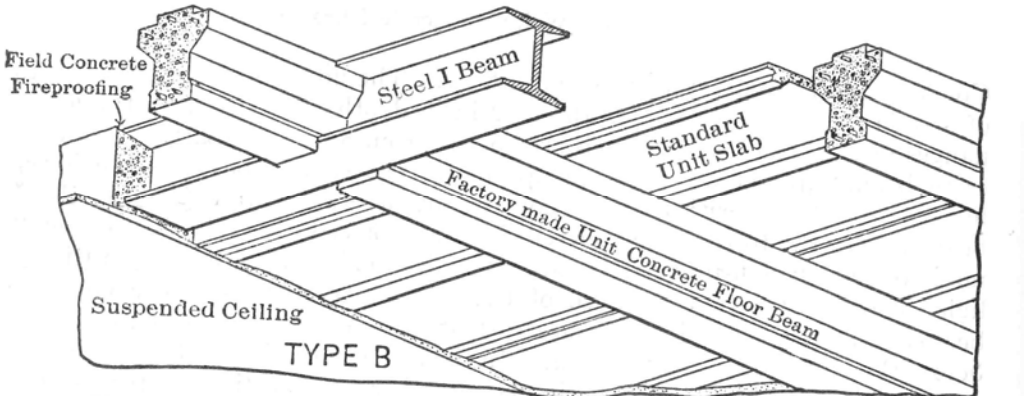


o Waite's I-Beam (Source: Kidder-Parker)



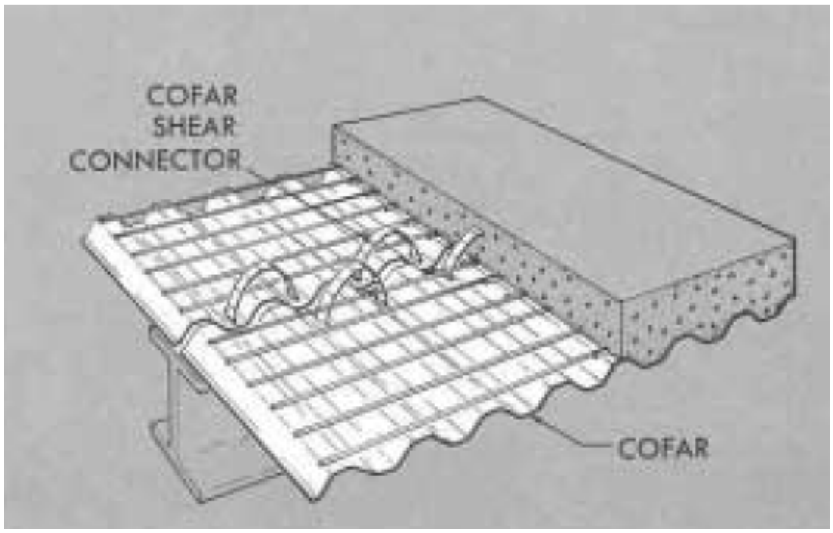
o Watson Reinforced Concrete Floor (Source: Kidder-Parker)



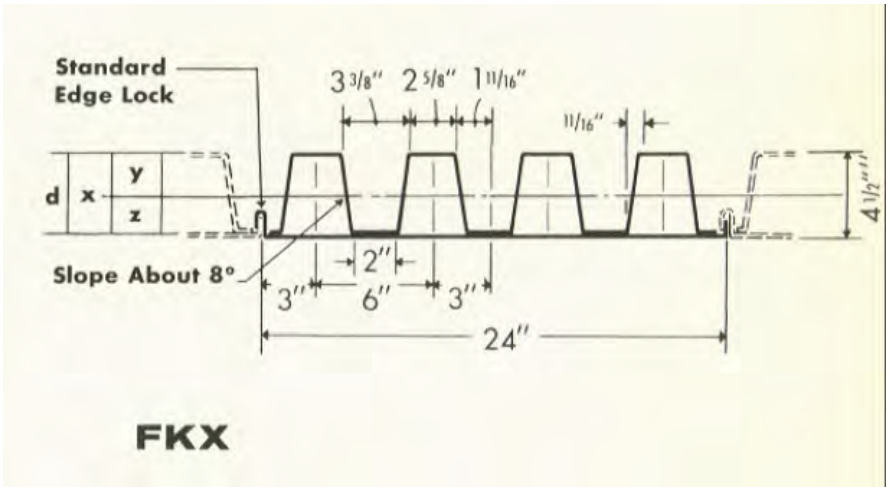


Metal Deck:

- **Granco** (Source: Granco)



- **HH Roberson FK** (Source: HH Robertson)



- **Truscon Hy-Rib** (Source: Truscon Buildings Co.)

Reinforcing:

- **Deformed**
  - American
    (No Image Available)

- Concrete Steel Company (Source: Trussed Concrete Steel Co.)
  - Round

Round

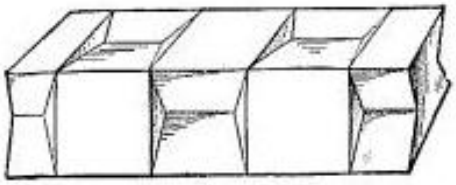
  - Square

Square

- Cup
  (No Image Available)

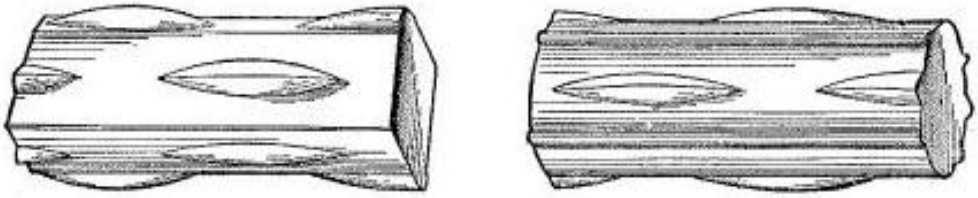
- Diamond
  (No Image Available)

- Elcannes (Source: Pocket Companion)



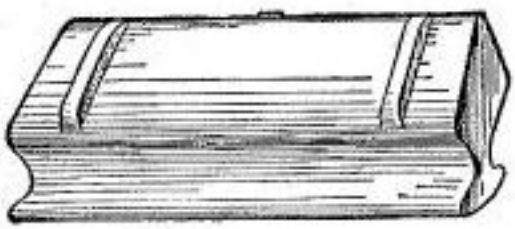
Elcannes Bar

- Havemeyer (Source: Pocket Companion)



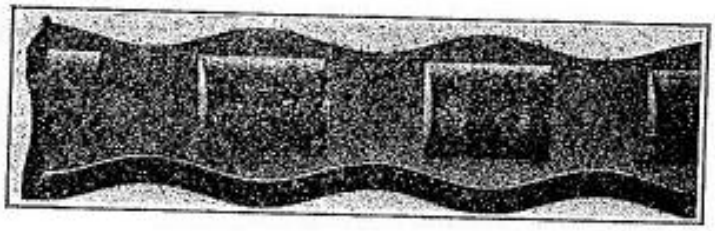
Havemeyer Bars

- Herringbone (Source: Pocket Companion)

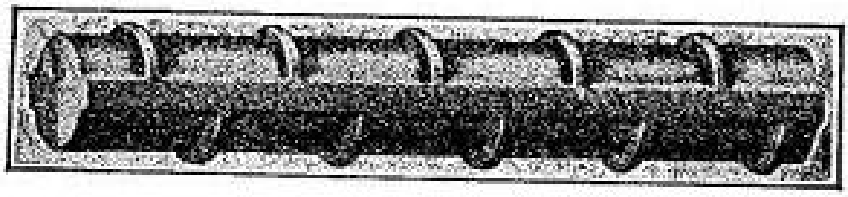


Herringbone Bar

- Johnson (Source: Building Construction and Superintendence)
  - Corrugated Flats



  - Corrugated Rounds



  - Corrugated Squares (New and Old Style)

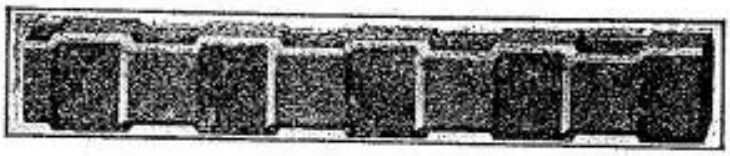


Fig. 509. Johnson Bar. Corrugated Squares. New Style.

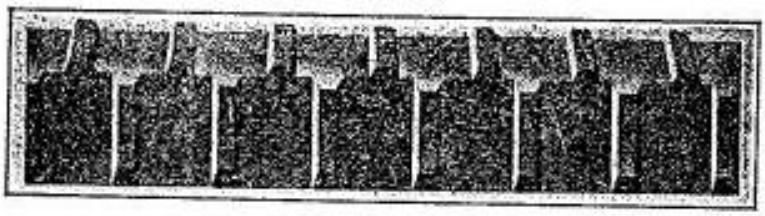
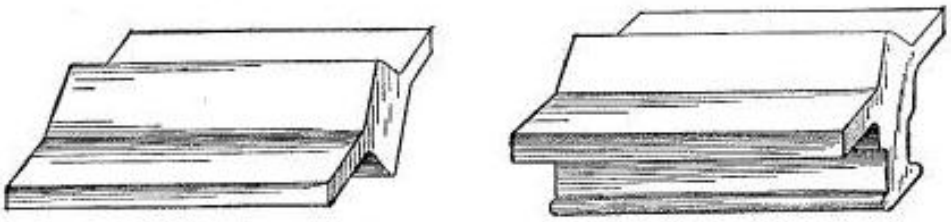


Fig. 510. Johnson Bar. Corrugated Squares. Old Style.

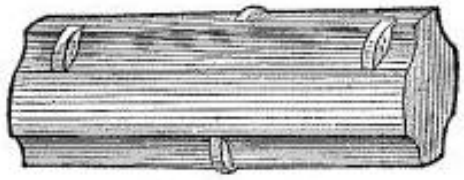
- Kahn Wing Bars (Source: Handbook of Building Construction)



Kahn Wing Bars

- Lug
  (No Image Available)

- Monotype (Source: Handbook of Building Construction)



Monotype Bar

- Priddle Inner Bond Bar (Source: Building Construction and Superintendence)

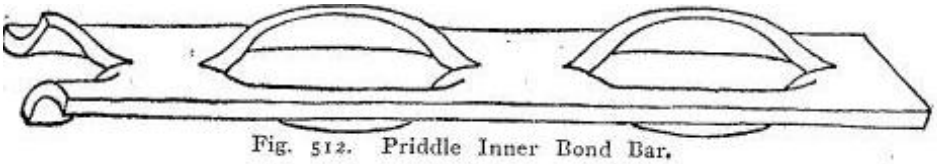


Fig. 512. Priddle Inner Bond Bar.

- Rib Bar
  (No Image Available)

- Scofield Bar
  (No Image Available)

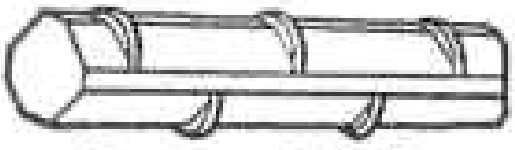
- Slant
  (No Image Available)

- Thatcher
  (No Image Available)

- Truscon (Source: Truscon Steel Company)
  - Round Rib

Round Rib Bar

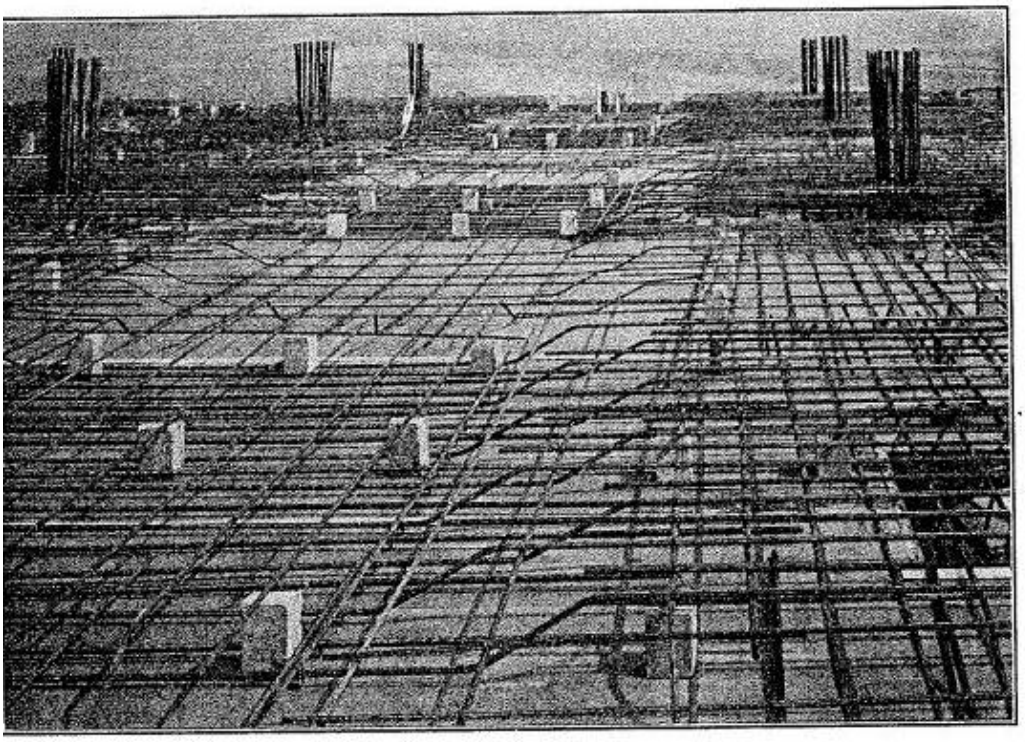
  - Square Rib



Square Rib Bar

- **Plain**
  (No Image Available)

- **Trussed** (Source: Concrete Engineers Handbook)



  - Prefabricated
    - Corr
      (No Image Available)

    - Cummings (Source: Radford's Cyclopedia of Construction)

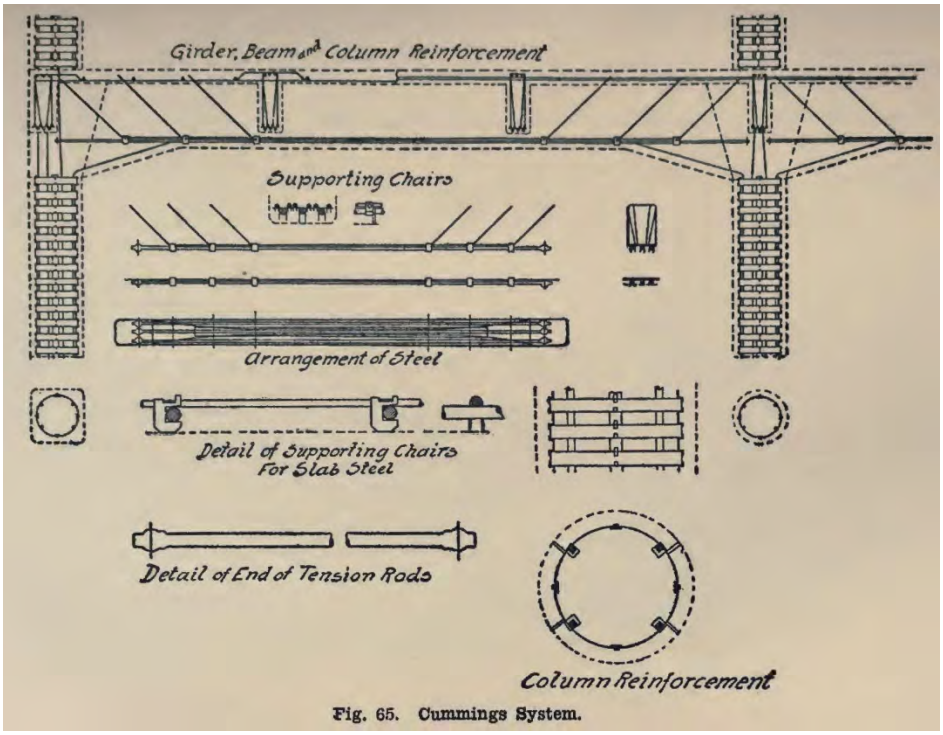
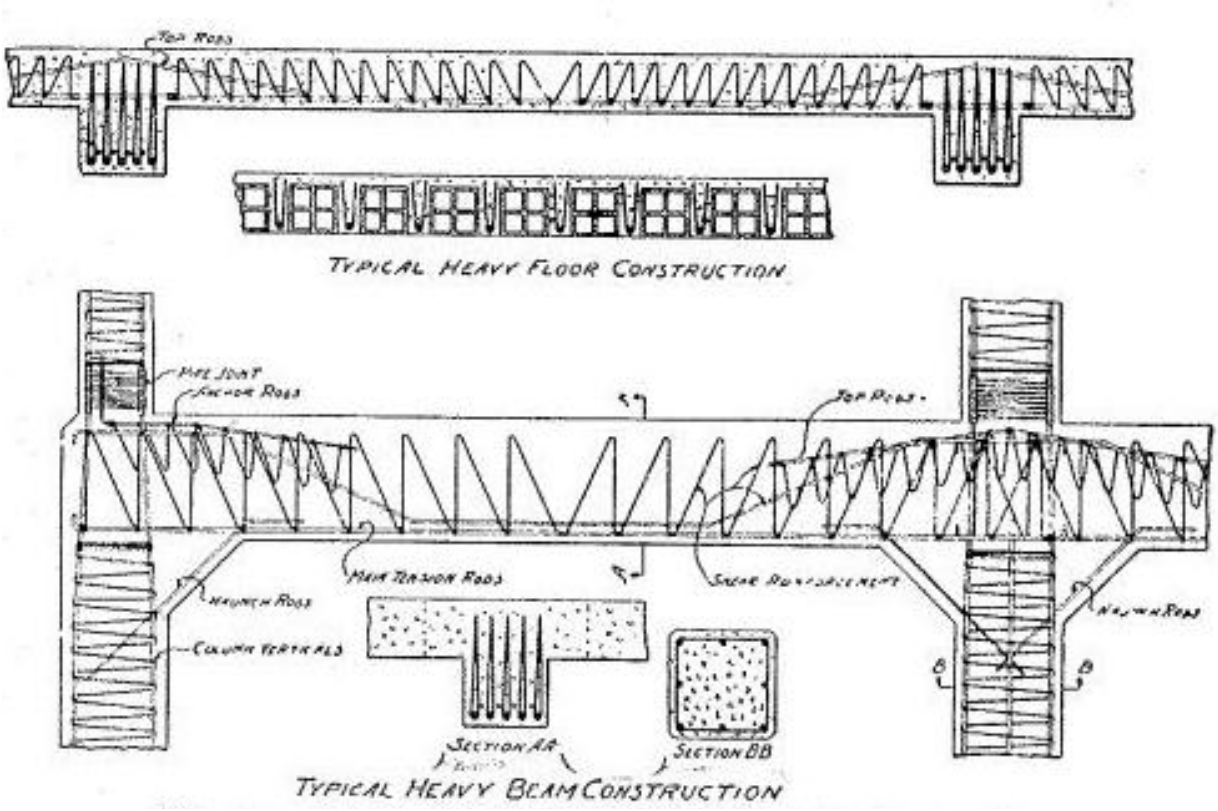
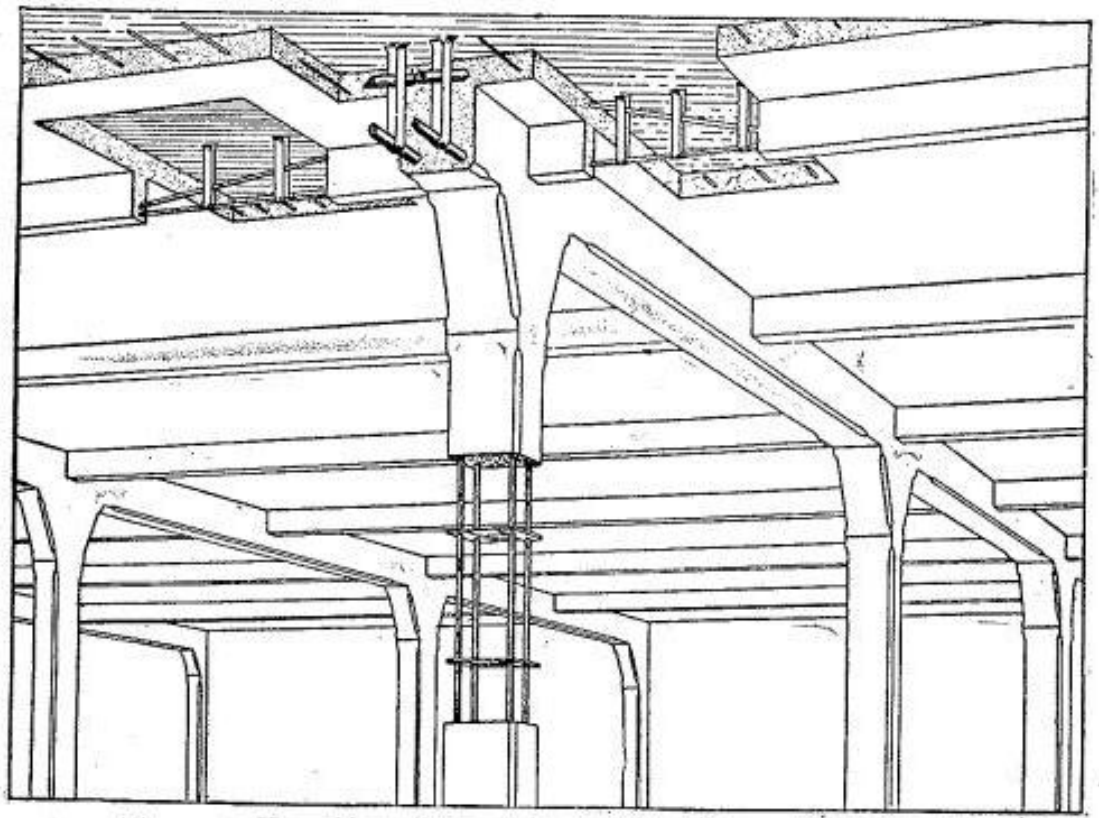


Fig. 65. Cummings System.

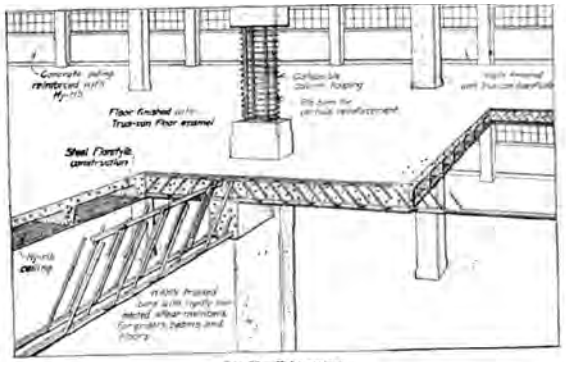
- Gabriel (Source: Radford's Cyclopedia of Construction)

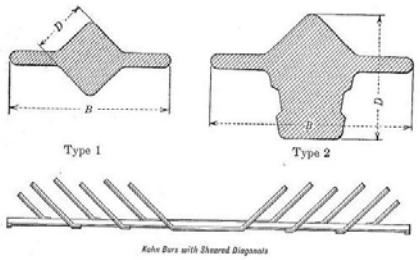


- Hennebique (Source: Building Construction and Superintendence)



- Kahn (Source: Handbook of Building Construction)





Kahn Bars with Sheared Diagonals

FIG. 2.—Sections of Kahn Trussed Bars. (See p. 13.)

Herringbone Bar.—The sizes and weights of the Herringbone bars are as follows:

Size, inches	1½	1¼	1	⅞	¾	⅝
Weight per foot, lb...	5.13	3.62	2.38	1.72	1.28	0.91

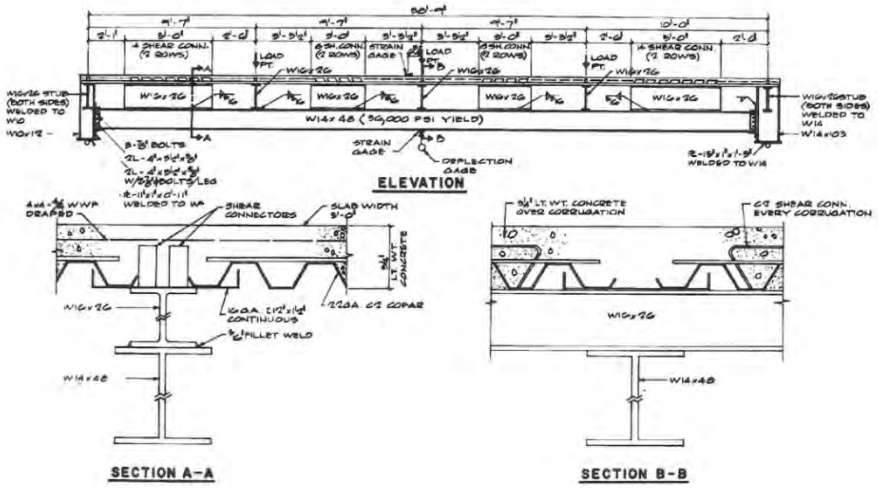
- Luten Truss
  (No Image Available)

- Pin Connected
  (No Image Available)

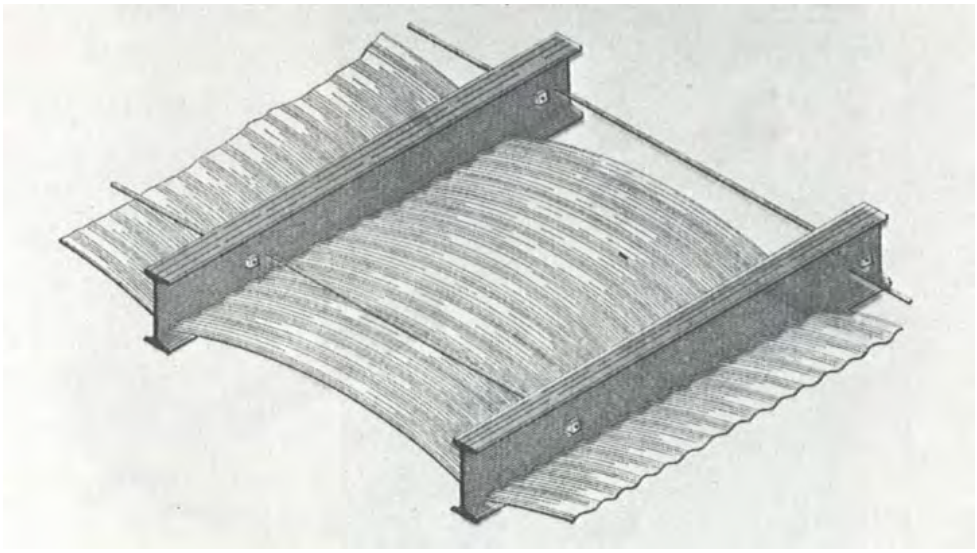
- Xpantruss
  (No Image Available)

<u>Steel</u>:

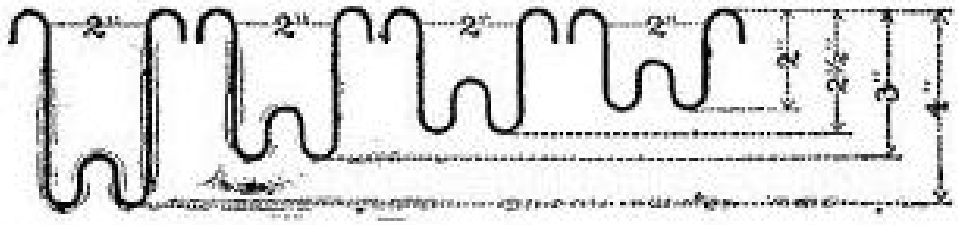
- **Composite Stub-Girder** (Source: AISC)



- **Corrugated**
  - Arched (Source: Library of Congress)



  - Berger (Source: Building Construction and Superintendence)



  - Buckeye
    (No Image Available)

  - Multiplex
    (No Image Available)

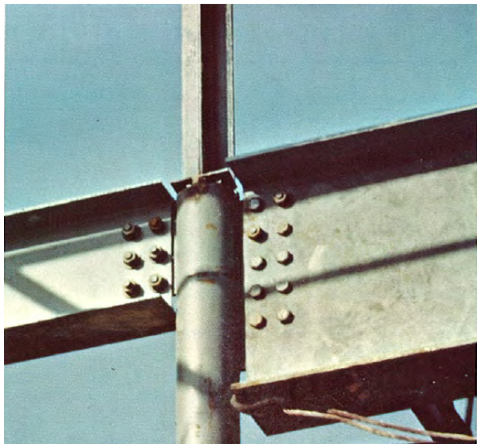
  - Pencoyd
    (No Image Available)

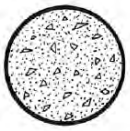
- **Expanded Metal**
  - Expanded Metal Company
    (No Image Available)

  - Manhattan
    (No Image Available)

- **Inverted Tee** (with brick flooring)
  - McCabe
    (No Image Available)

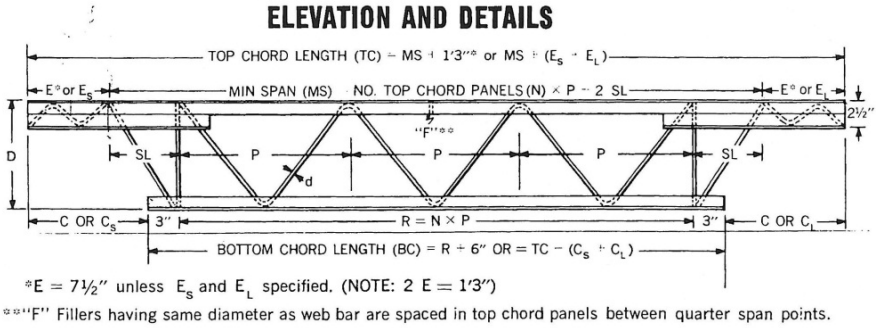
- **Lally Column** (Source: Tubular Products Incorporated)

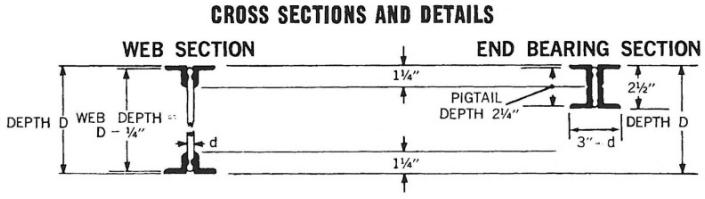




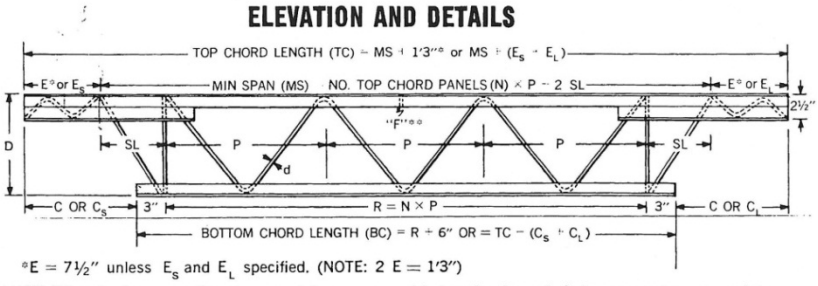
- **Pre-Engineered Open Web Joists** (Source: SJI unless noted otherwise)
  - Armco
    (No Image Available)

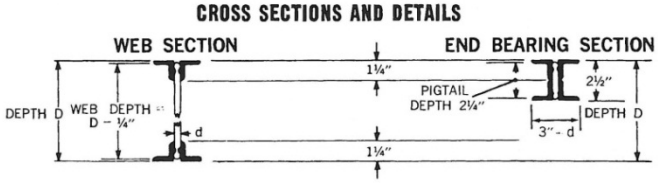
  - Ashland
    - HS Series





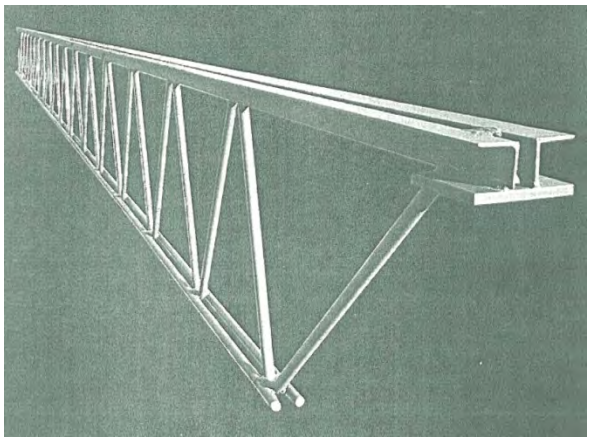
    - LS Series



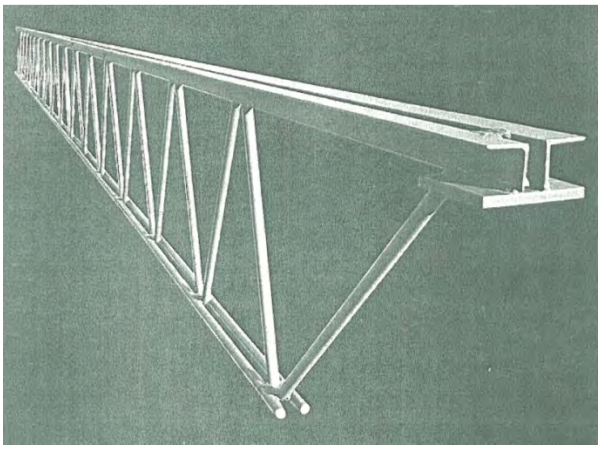


- Berger
  (No Image Available)

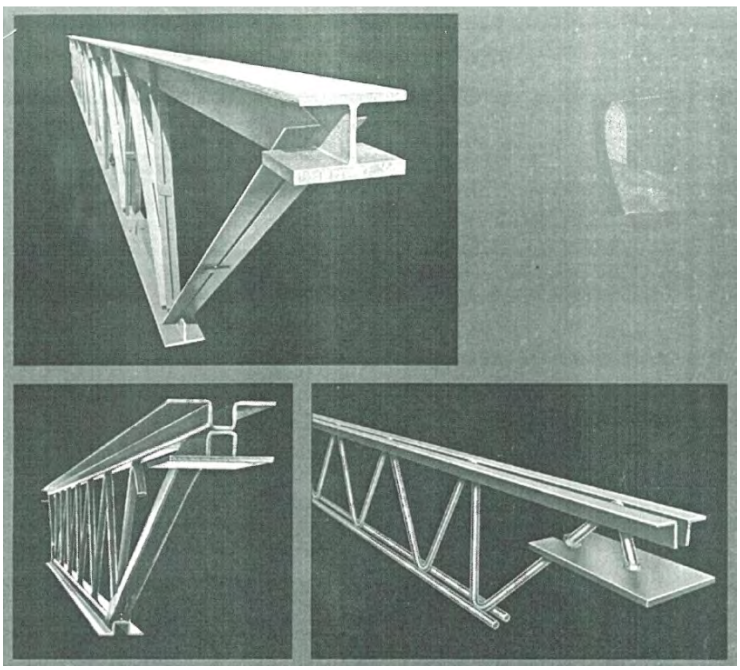
- Bethlehem
  - BH Series



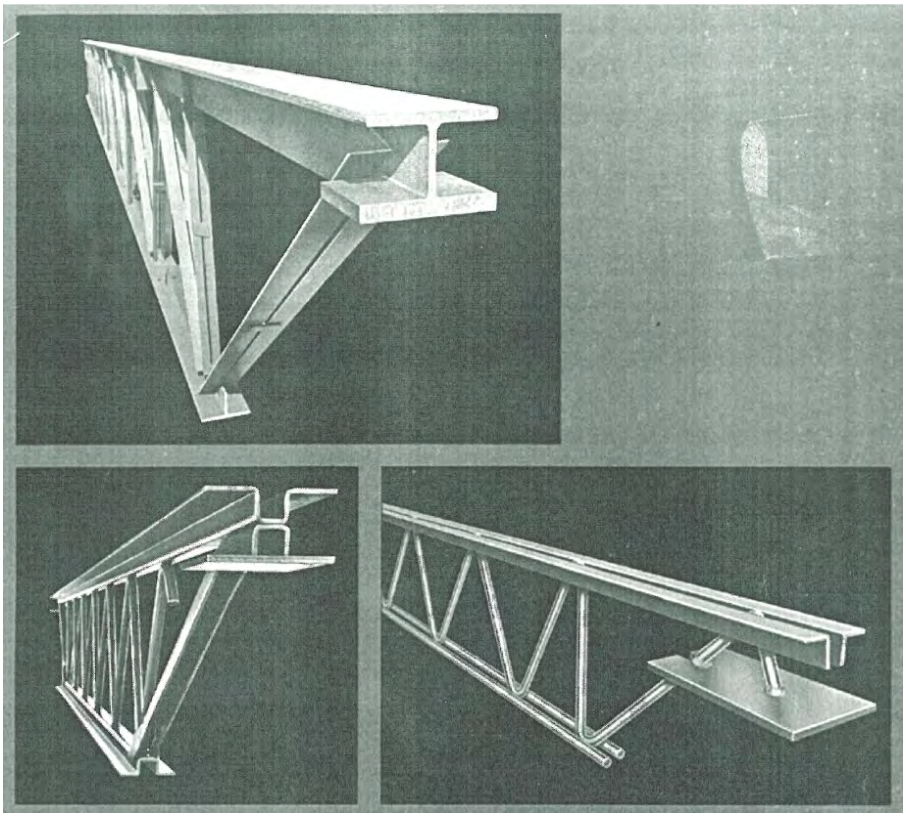
  - BJ Series



  - BLH Series

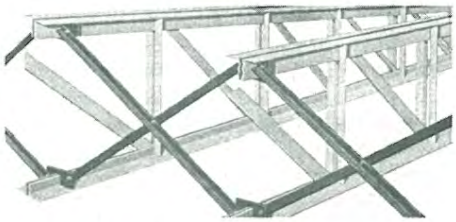


- BLJ Series



- Kalman Truss

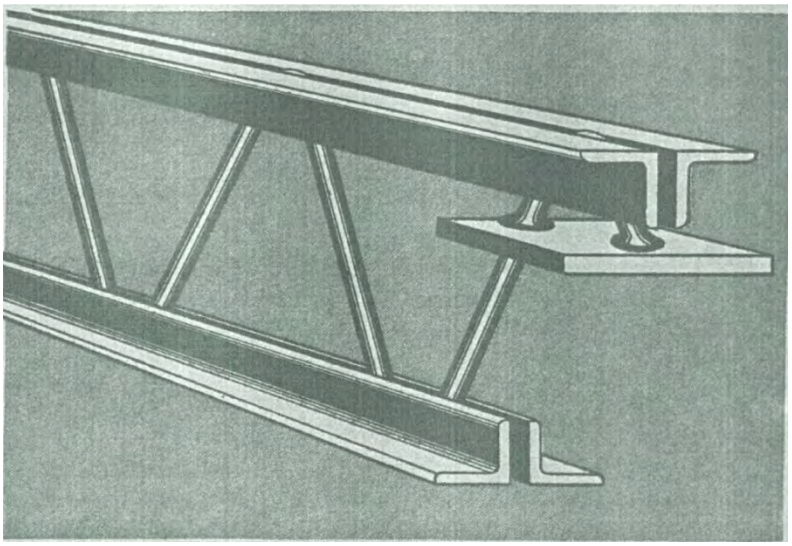
- Longspan



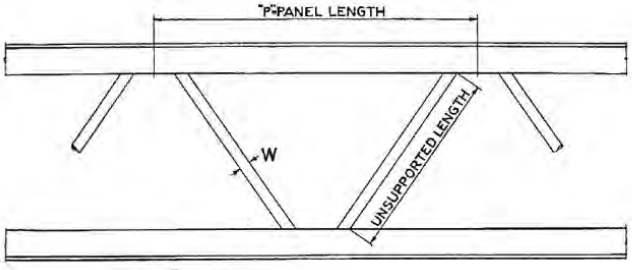
RIGID BRIDGING

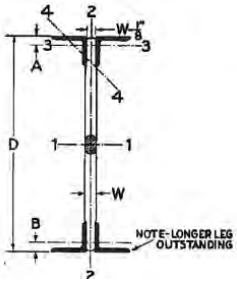
CEILING EXTENSION RODS

- MacMar



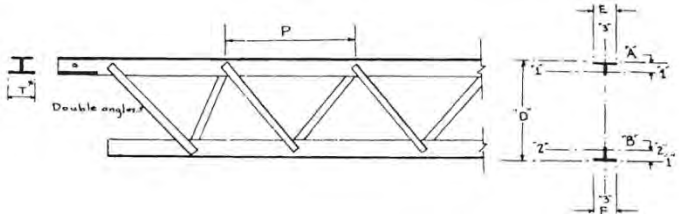
- Standard



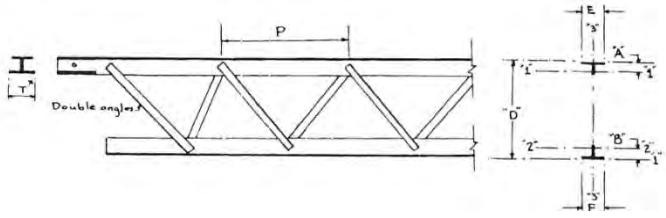


o Cadmus

- Standard

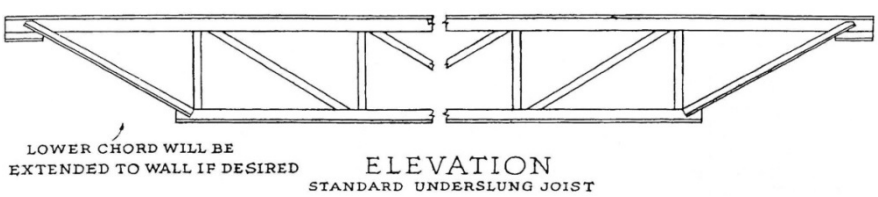


- T Longspan



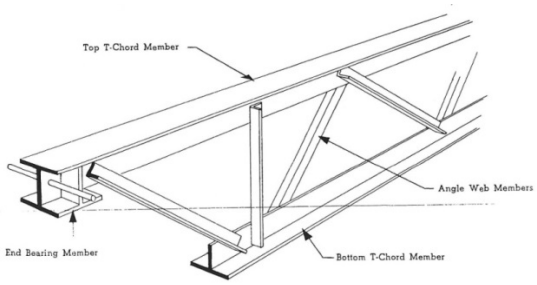
o Gabriel

- Longspan



- H-Series
  (No Image Available)

- Haven Busch
  - T-Chord Longspan



- J-Series
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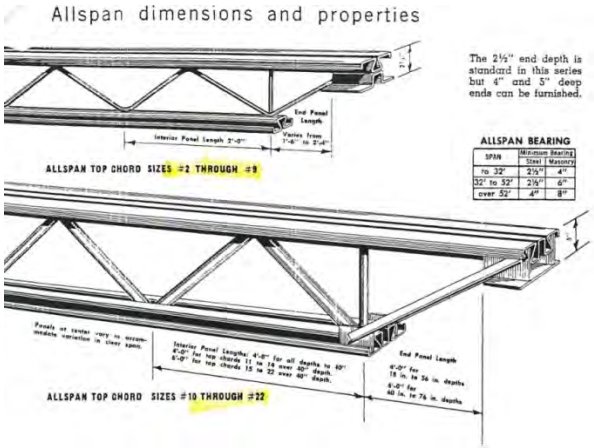
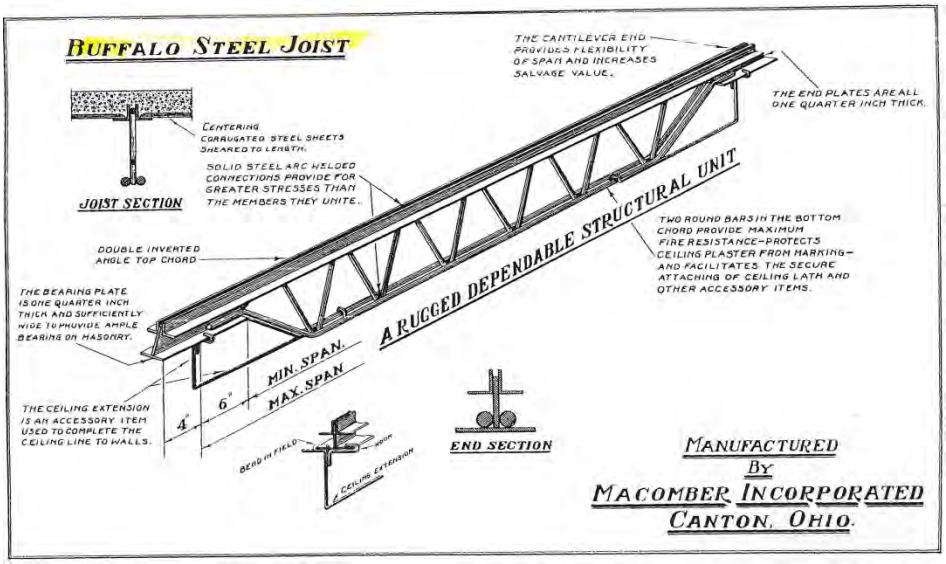
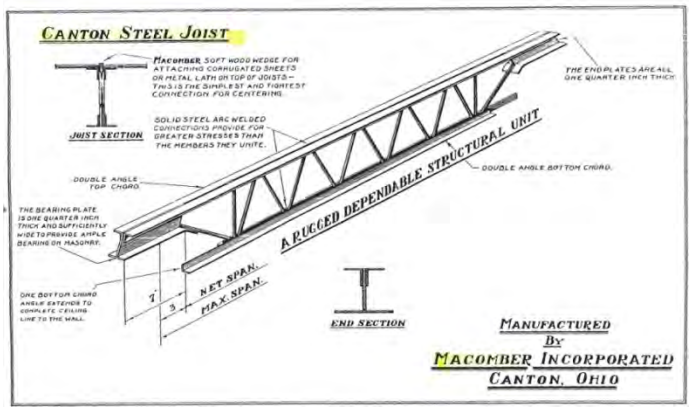
- Macomber
  - Allspan



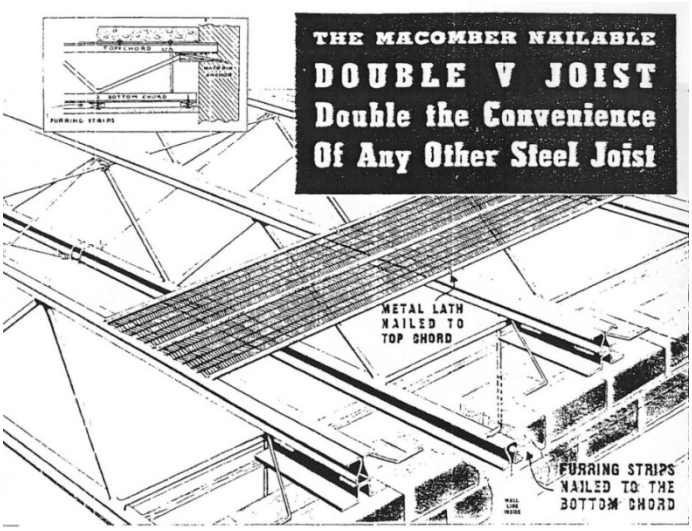
  - Buffalo



- Canton



- Double V



- Intermediate Longspan
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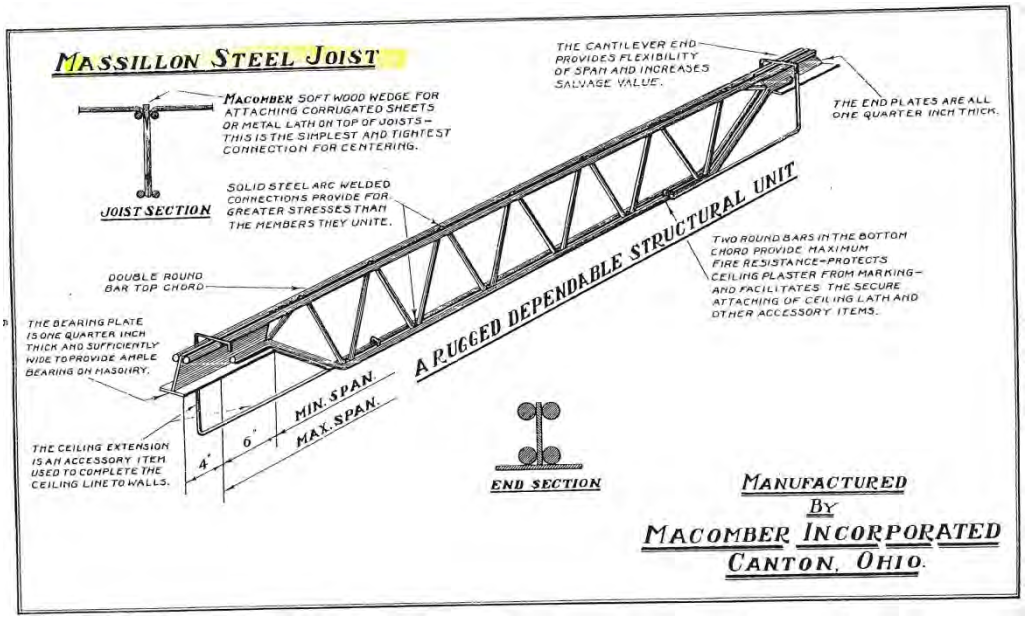
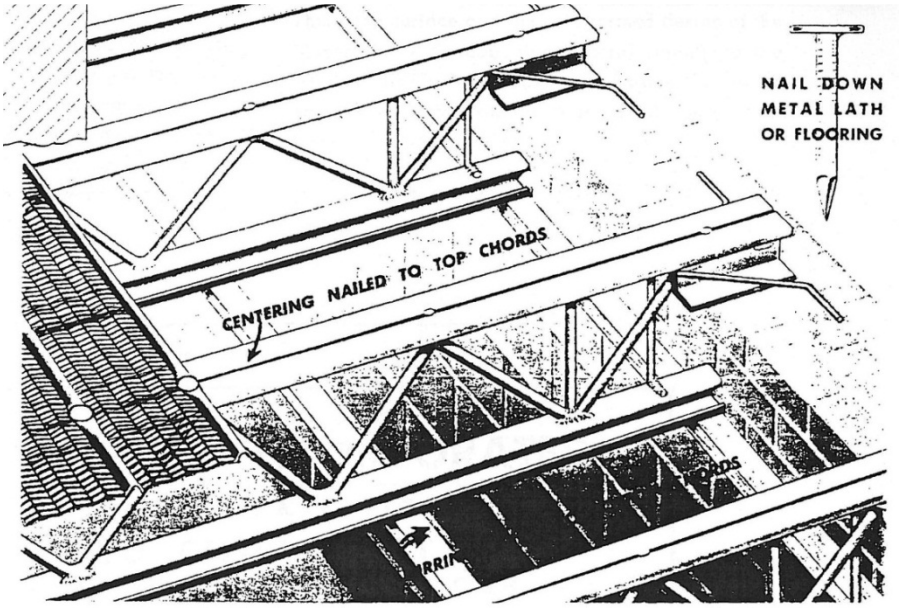
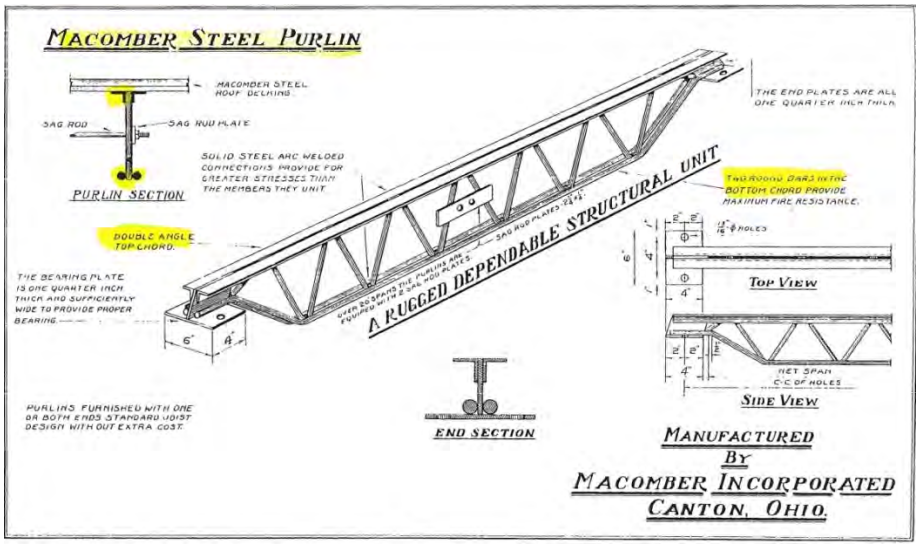
- Massillon



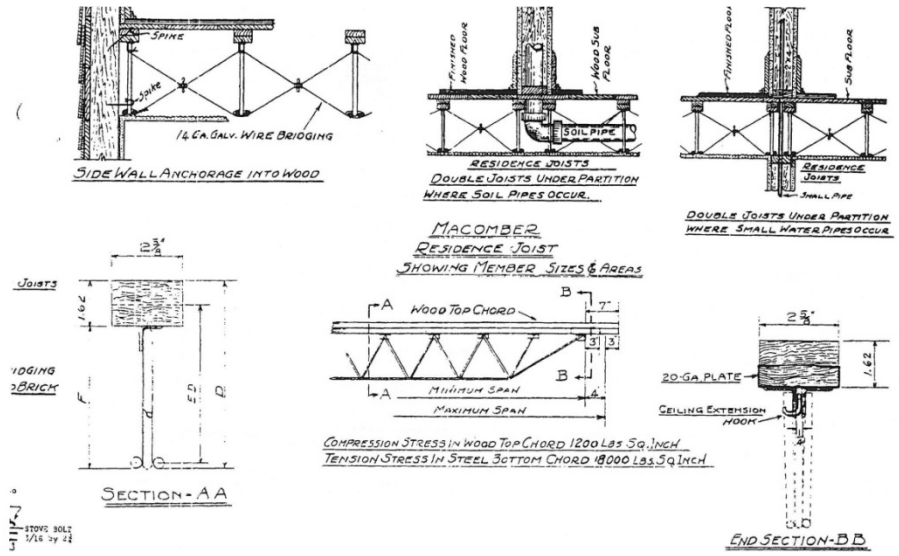
- New Yorker



- Purlin

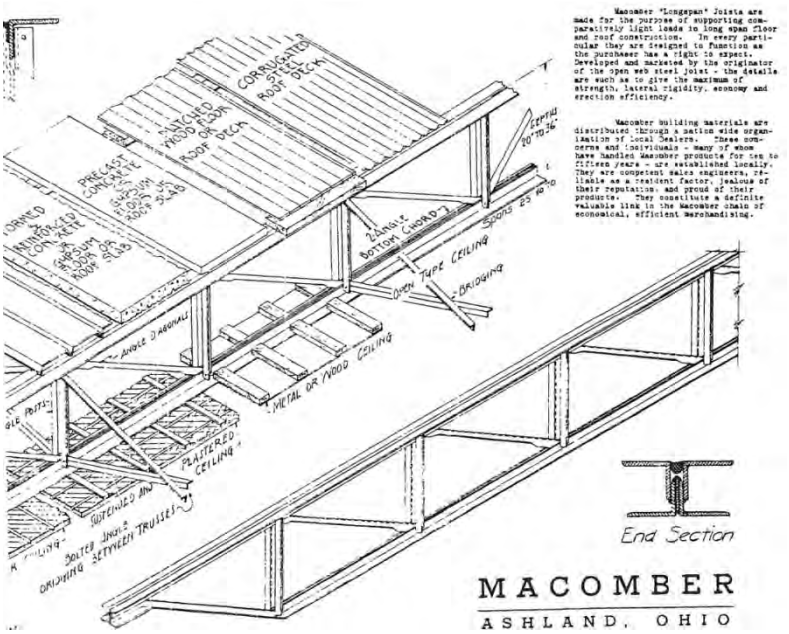


- Residence

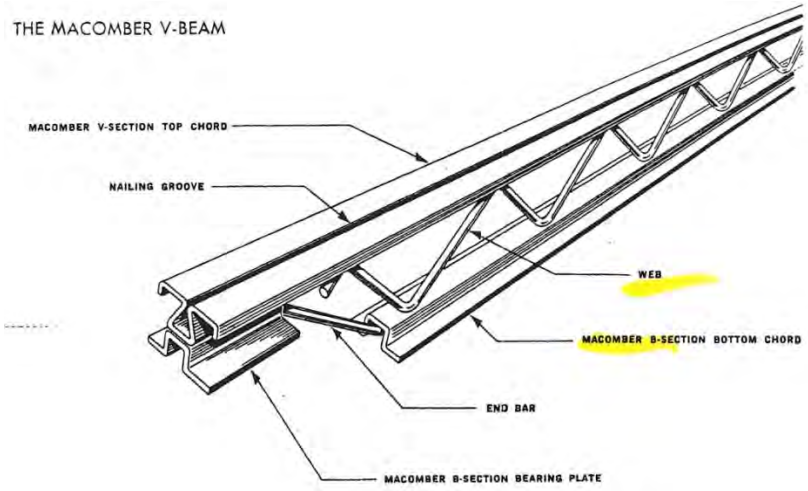


- Special
  (No Image Available)

- Standard Longspan



- V-Beam



- V-Girder
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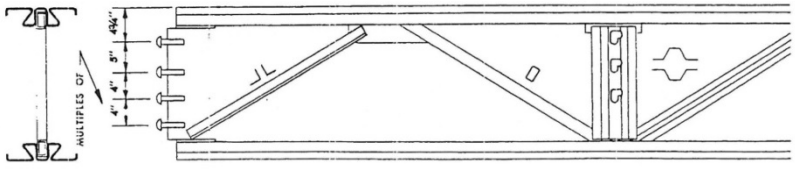
- V-Lok Girder



- V-Lok Purlin
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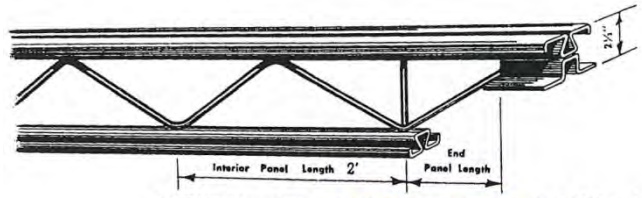
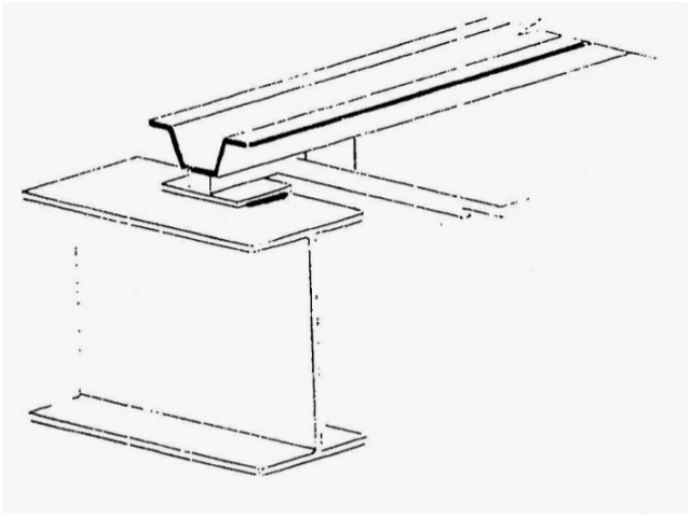
- V-Purlin



V-PURLIN TOP CHORD — SIZES #2 THROUGH #9

The 2½" end depth is standard in the No. 1 Series, but 4" and 5" deep ends can be furnished. All panel points in this series are on 2' centers.

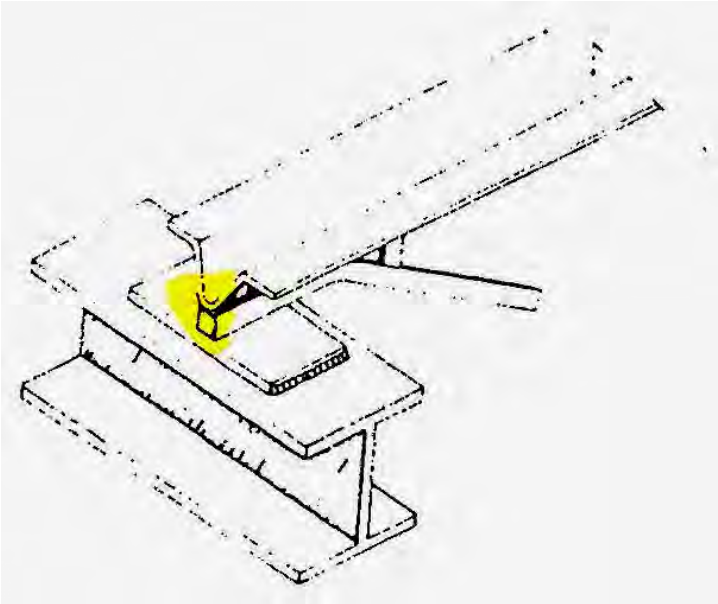
o Northwest
  - Series 1, 2, 3 & 4



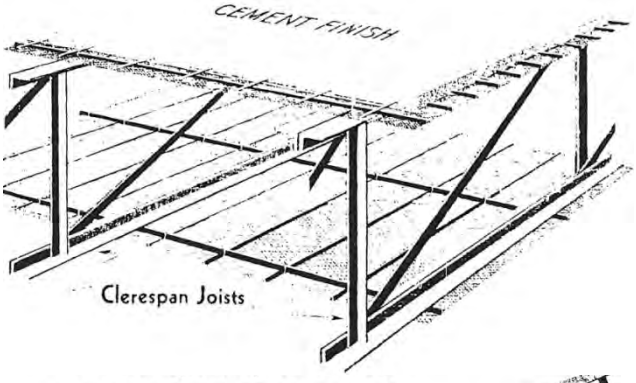
o Raychord
(No Image Available)

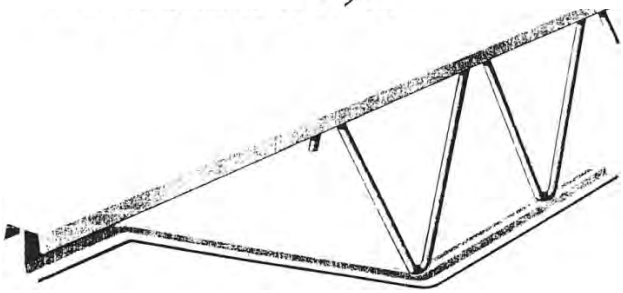
o Republic
(No Image Available)

o Ridgeway

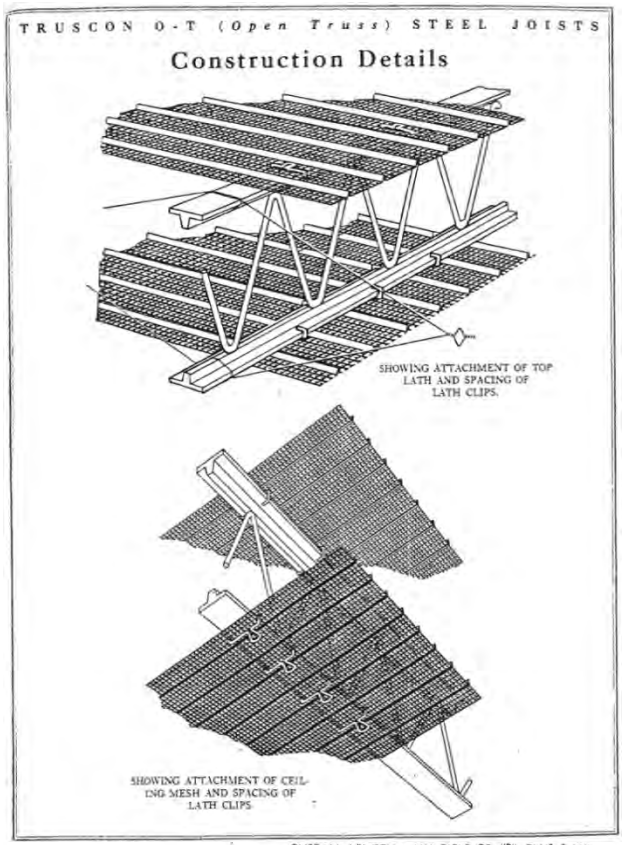


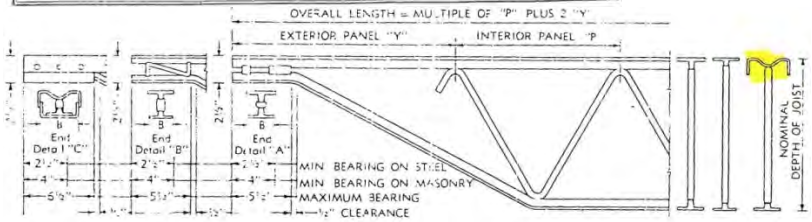
- Truscon
  - Clerespan



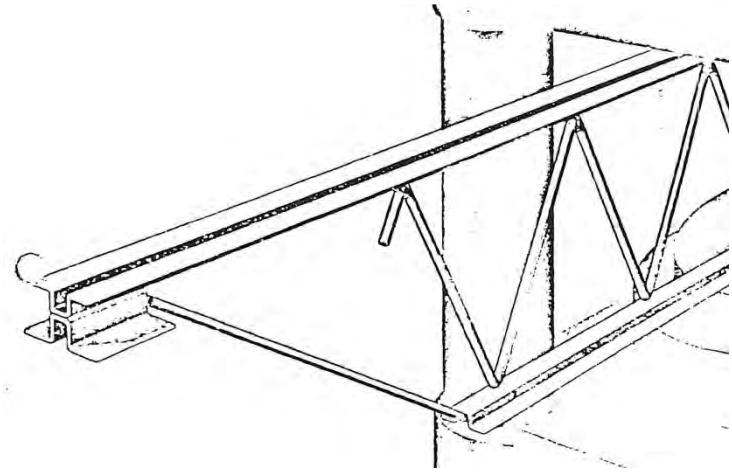


  - O-T (Open Truss)

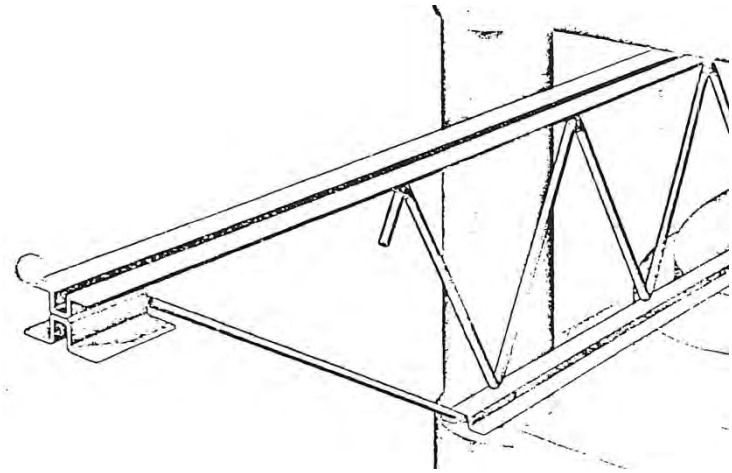




- Series AS

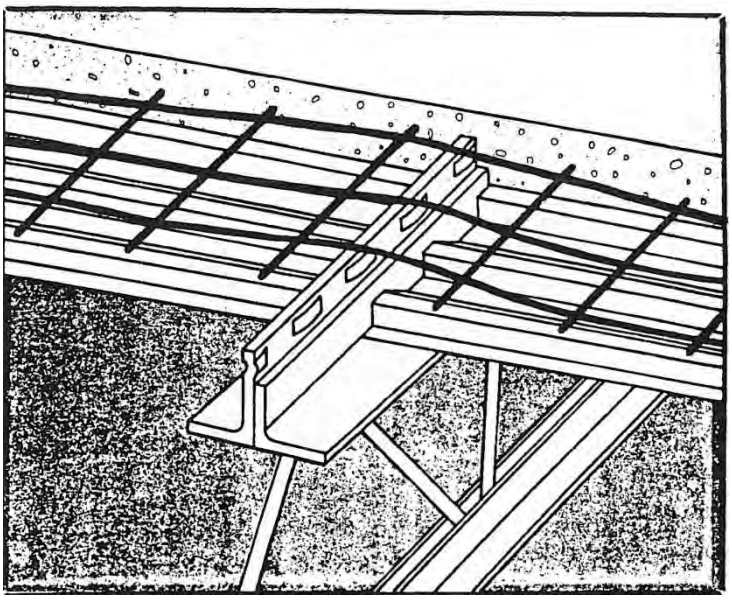


- Series BB



- USS Ambridge
  (No Image Available)

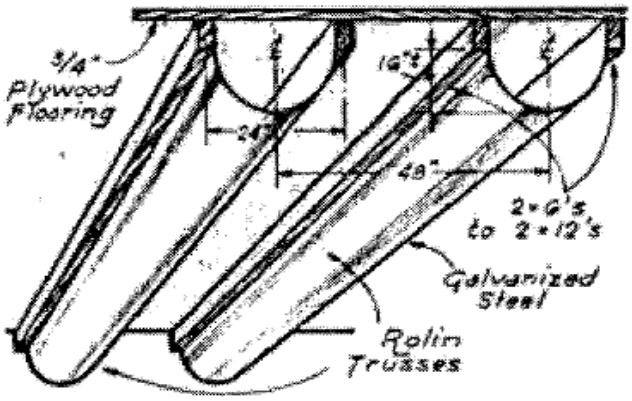
- Vescom
  - Composite Floor Joists



- Composite Truss Girder
  (No Image Available)

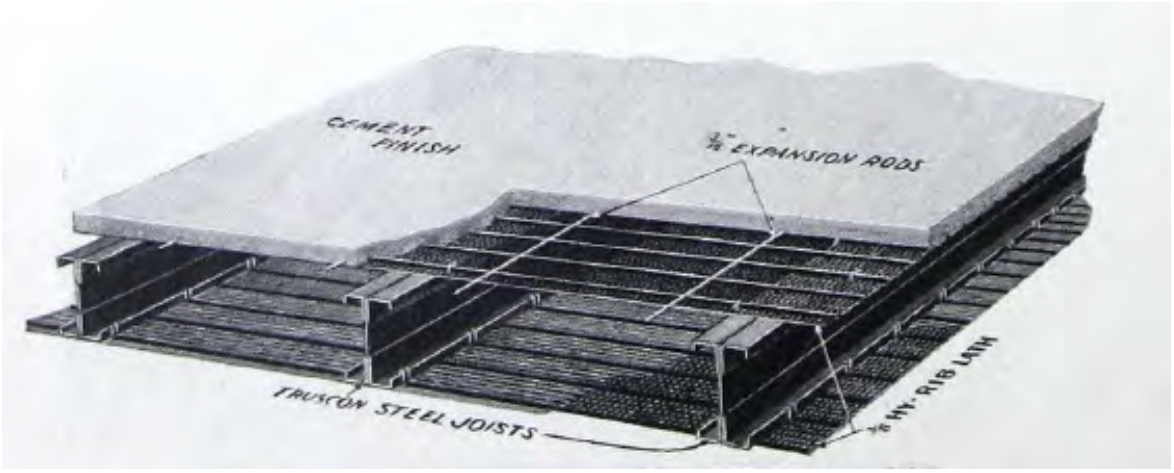
- **Riveted Open Web Joist** (Source: DMS)

- **Rolin Truss** (Source: Popular Science)



Prefabricated trusses look like stock-feeding troughs but can support up to 110 pounds psf and loaded spans up to 65 ft. Single or double layers of 16- or 18-gauge galvanized sheet steel is bent and nailed to joists.

- **Truscon Steel Joist** (Source: Truscon Buildings Co.)



<u>Terra Cotta</u>:

- **Cornice** (Source: Building Construction and Superintendence)

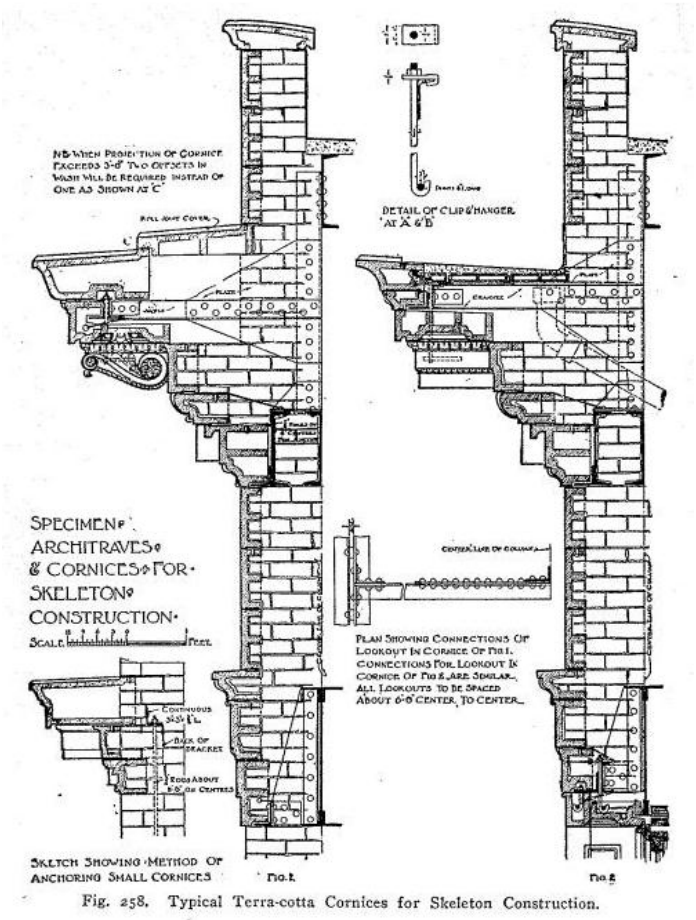
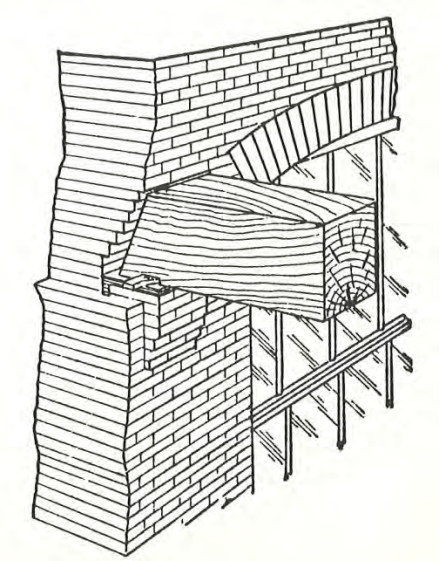


Fig. 258. Typical Terra-cotta Cornices for Skeleton Construction.

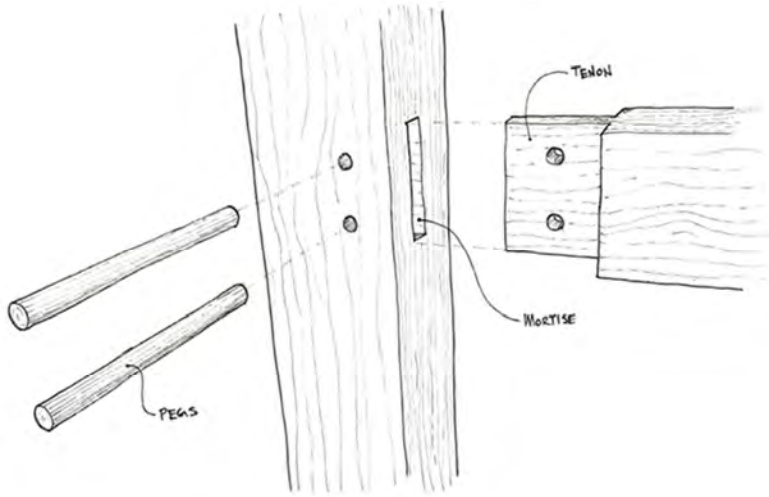
- **Guastavino Timbrel Arch** (Source: Historic American Building Survey)

Timber:

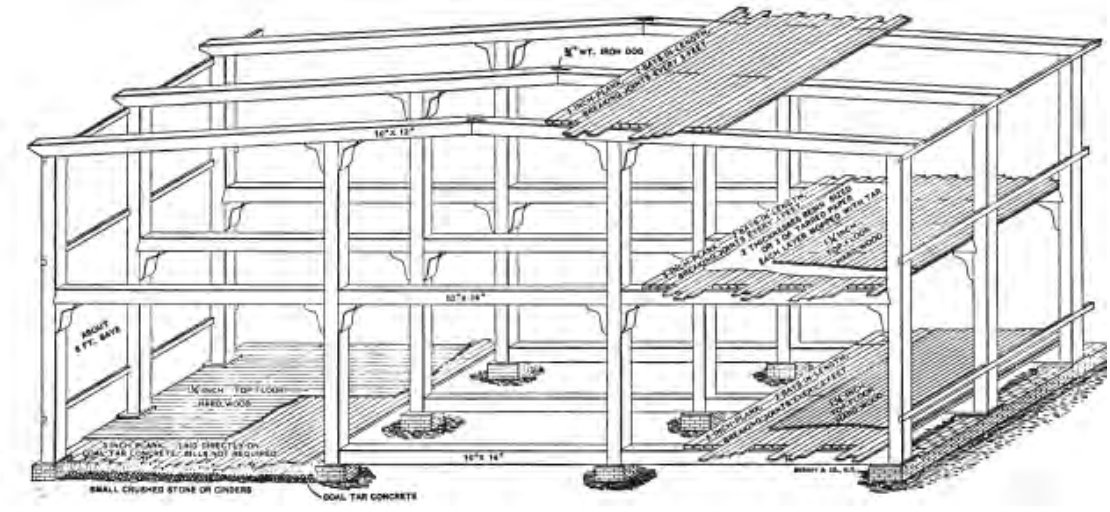
- **Fire Cut End** (Source: Freitag)



- **Joints**
  - Mortise and Tenon (Source: Frameworks Timber)



- **Mill Construction** (Source: Construction Equipment and Management)



- **Trussed- Beam** (Source: Notes on Building Construction)

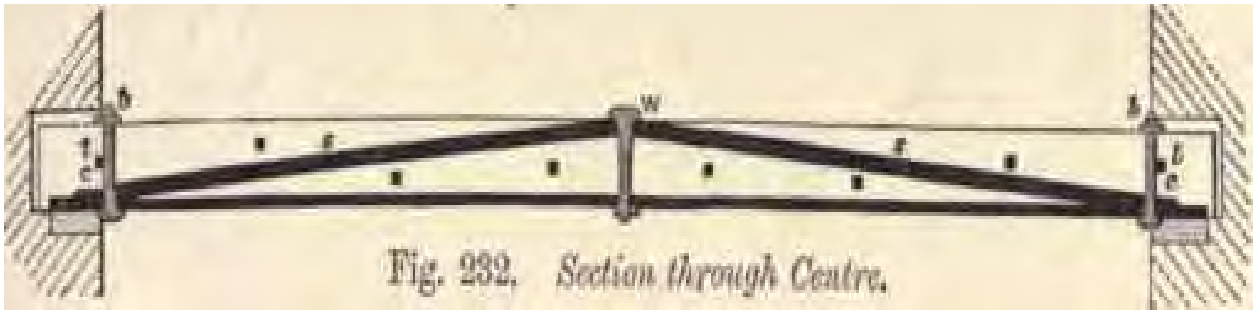
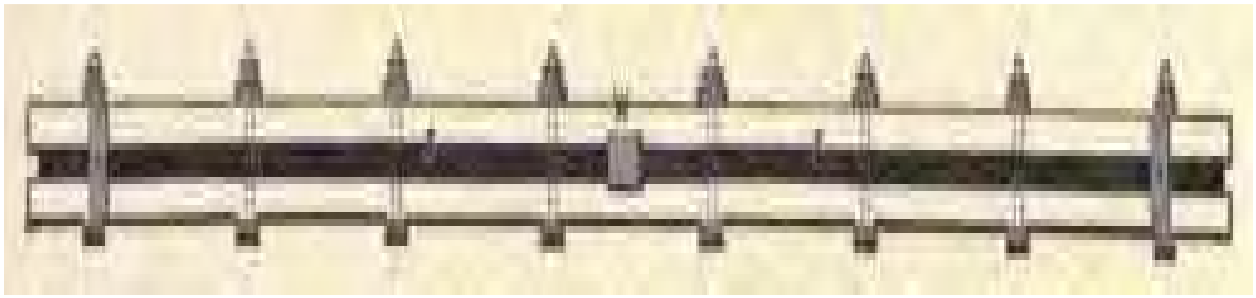


Fig. 232. *Section through Centre.*

Elevation



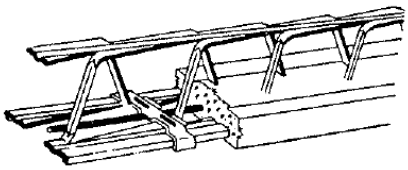
Plan

<u>Unit Masonry</u>:

- **One-Way Joists**
  - Kalex (Source: Jeff Poole)

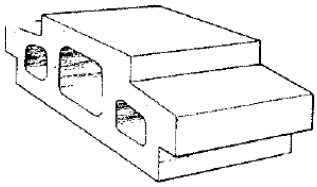
- Omnia Joist and Block System (Source: Omnia Industries, Inc.)

Only Three Components

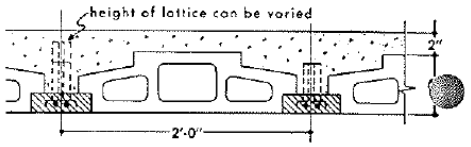


1 - Omnia Joist

Omnia joists are formed to exact lengths by enclosing the patented Omnia steel lattice in

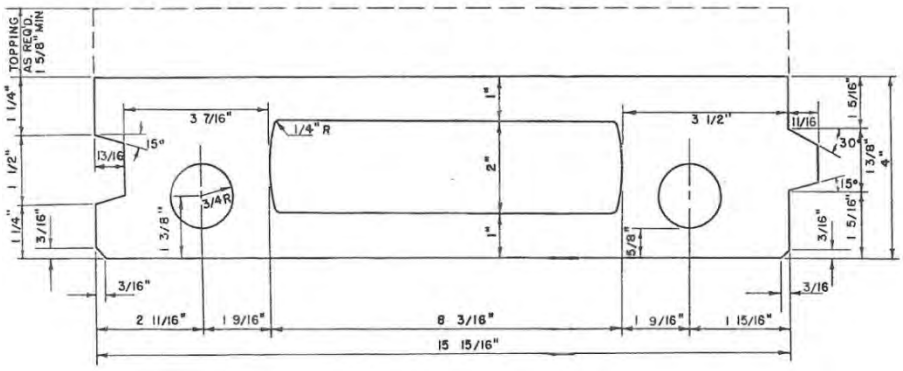


2 - Omnia Concrete Block



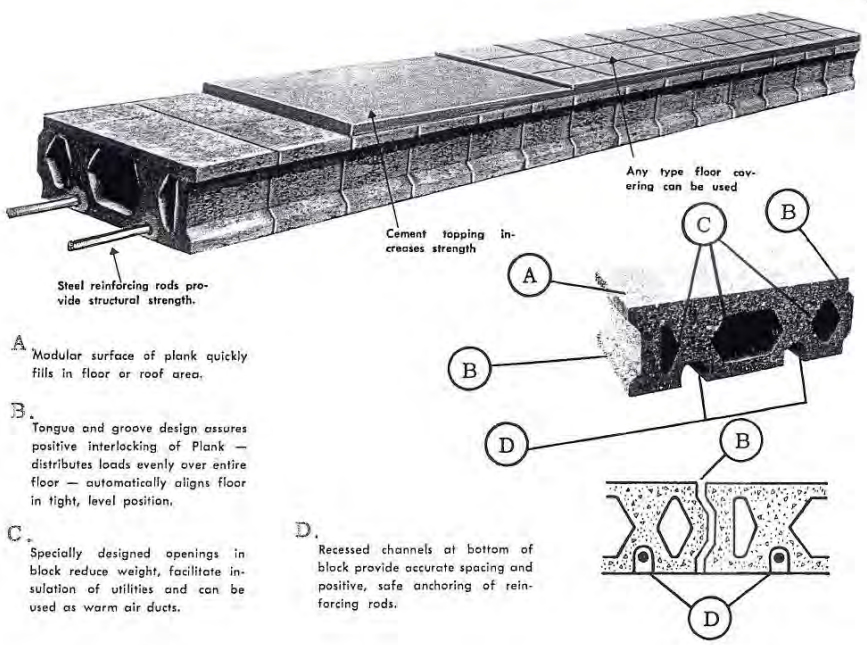
3 - Poured Concrete Forms Monolithic Structure

- Prefabricated (Source: NCMA)
  - Dox Plank (Alternate)



  - Flexicore
    (No Image Available)

  - NABCO Dox Plank



- Republic Slagblok
  (No Image Available)

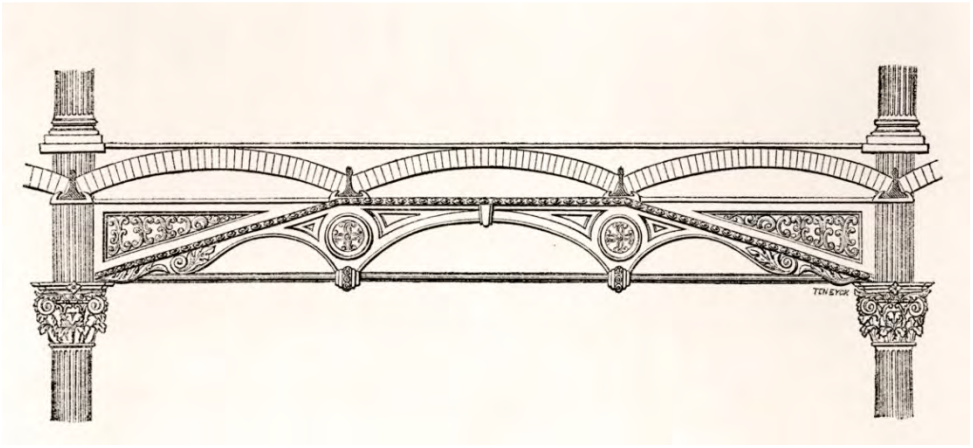
- **Two-Way Joists**
    - Republic Slagblok (Source: DMS)

<u>Wrought Iron</u>:

- **Channel Beam** (Source: John Sandifer)

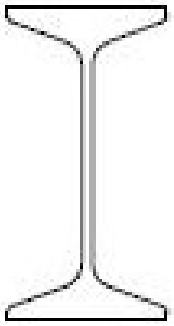
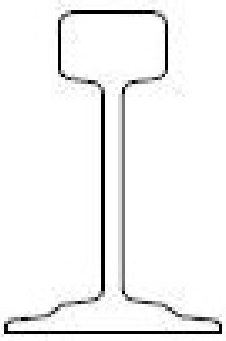
- **Composite Cast Iron and Wrought Iron**
    - Perforated Girder (Source: Historic American Building Survey)

- Truss (Source: Peabody Essex Museum)



- **Deck Beam** (Source: John Sandifer)

- **I Beam** (Source: John Sandifer)



- **Rail Beam** (Source: John Sandifer)