A. MILLER.

PORTABLE BUILDING STRUCTURE.

APPLICATION FILED SEPT. 3, 1912.

1,075,368.

Patented Oct. 14, 1913.

4 SHEETS—SHEET 1.

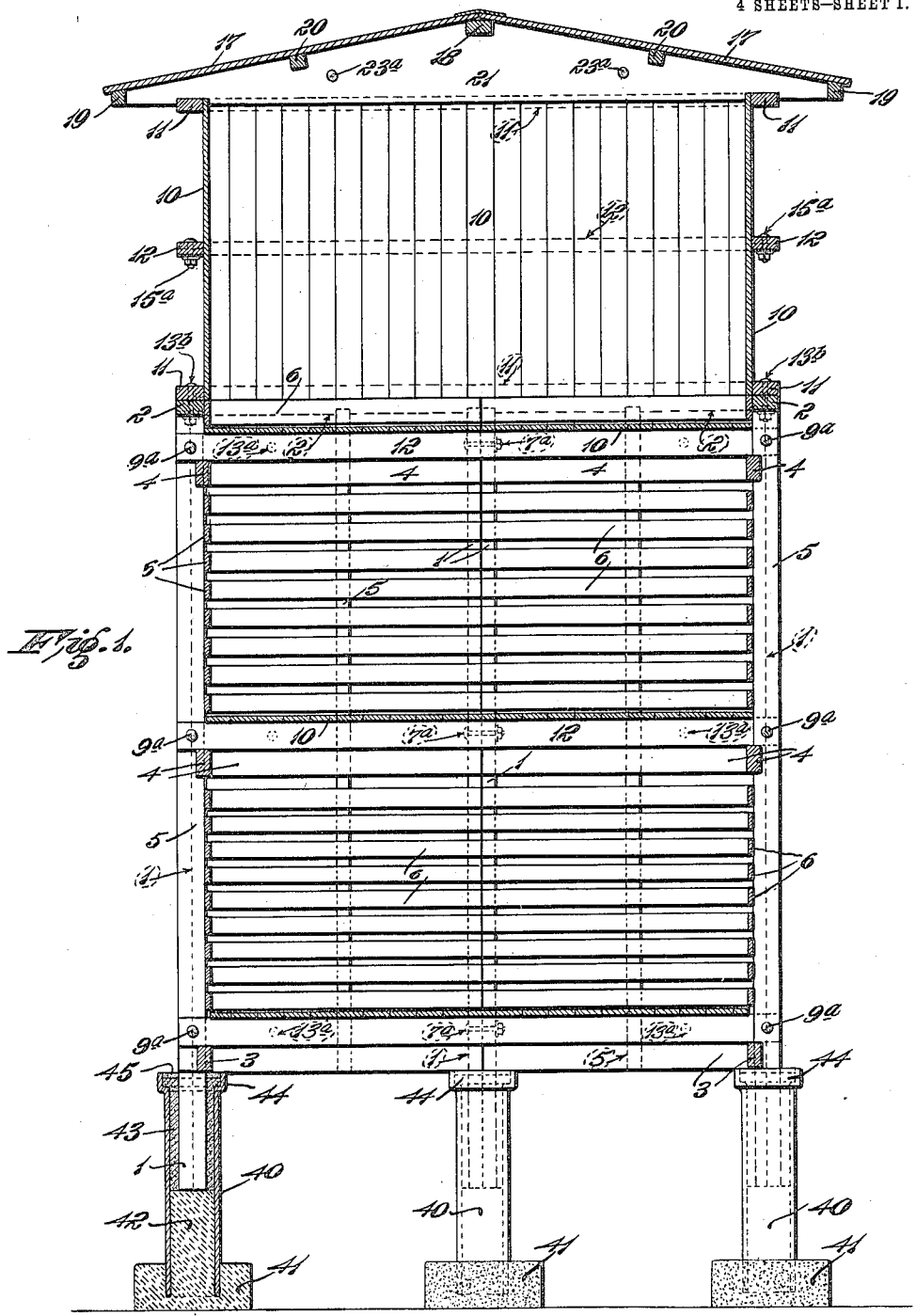


Fig. 1.

Witnesses:
Edgar T. Farmer
G. A. Pennington

Inventor:
Adolph Miller,
By Church & Church
His Attys.

A. MILLER.

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4 SHEETS—SHEET 2.

Fig. 2.

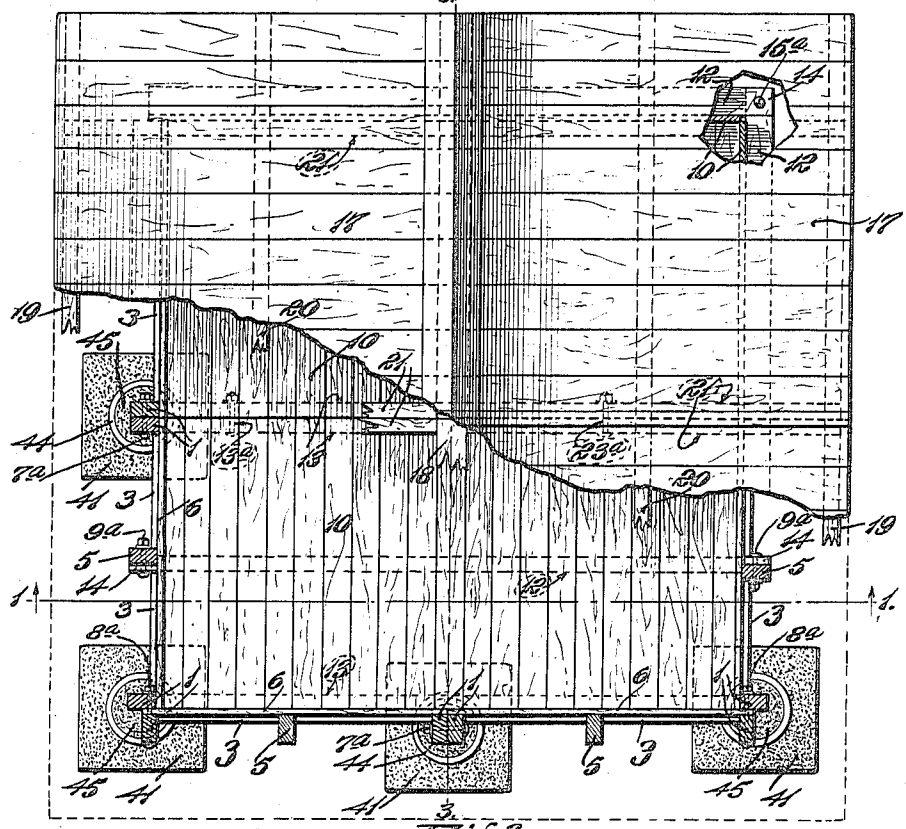
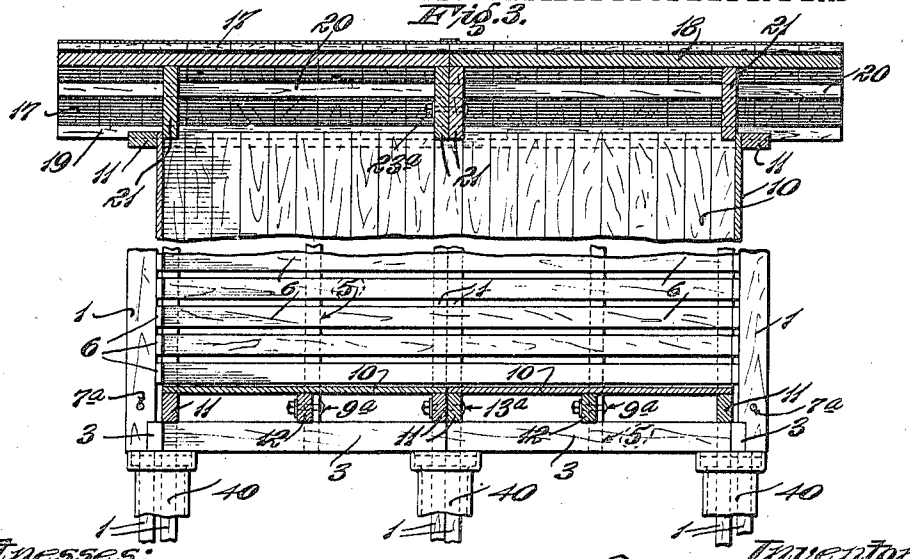


Fig. 3.



Witnesses:
Edgar T. Farmer
G. A. Pennington

Inventor:
Adolph Miller,
By Church & Church
his Attys.

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4 SHEETS—SHEET 3.

Fig. 4.

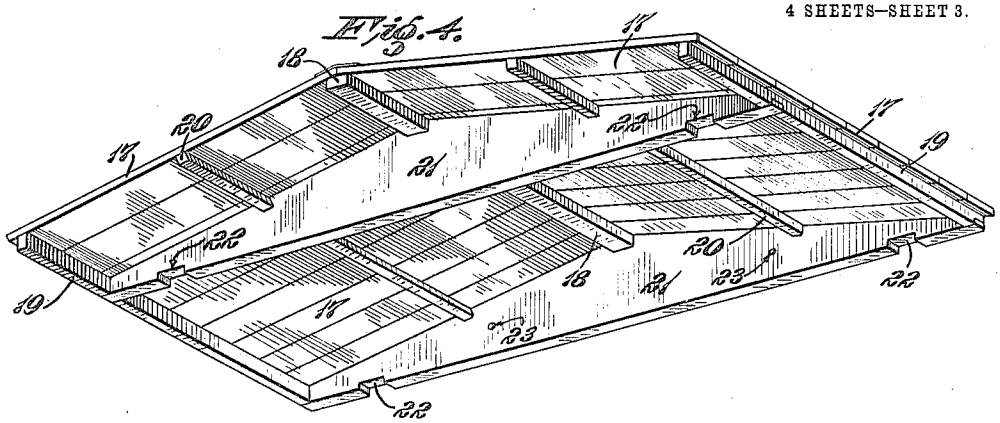


Fig. 6.

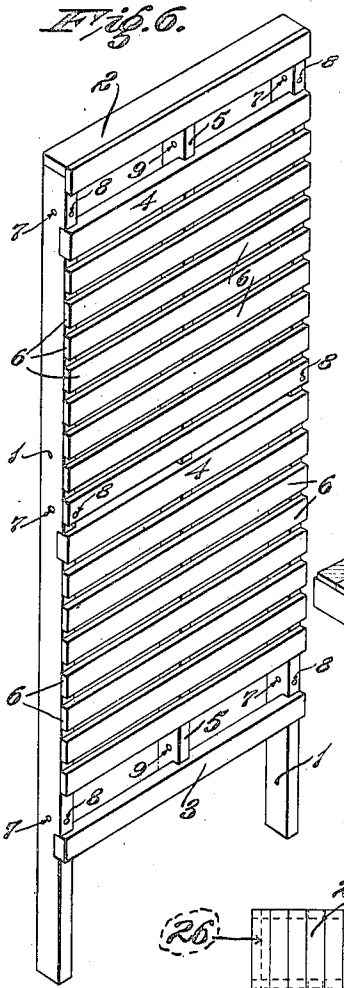


Fig. 5.

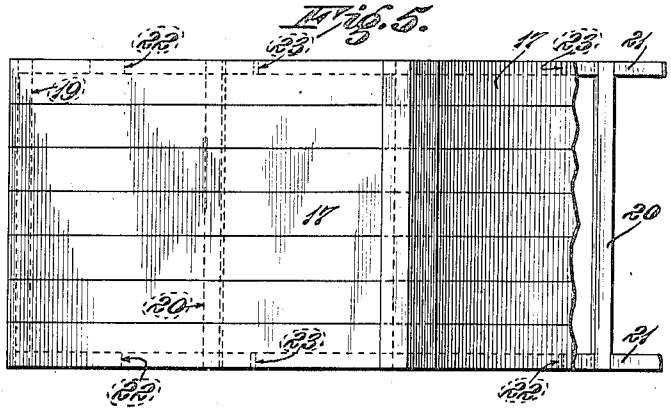


Fig. 7.

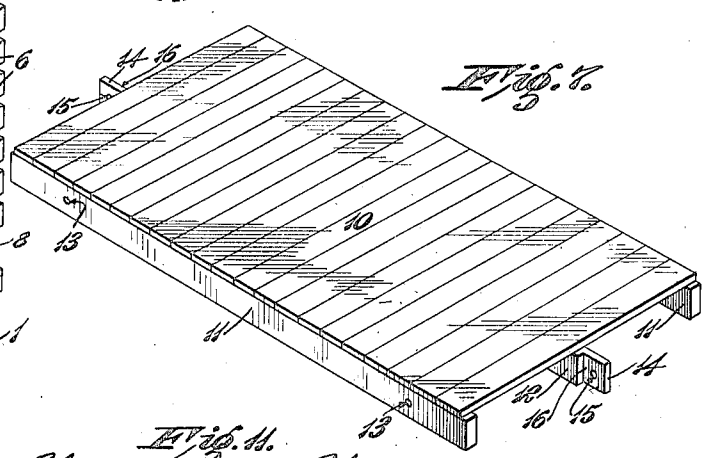
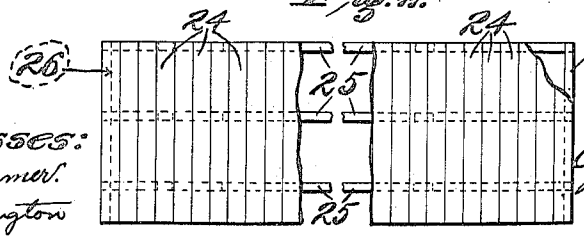


Fig. 11.



Witnesses:
Edgar T. Farmer.
G. A. Pennington

Inventor:
Adolph Miller
By Lamb & Lamb
his Attys.

A. MILLER.

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APPLICATION FILED SEPT. 3, 1912.

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4 SHEETS—SHEET 4.

Fig. 8.

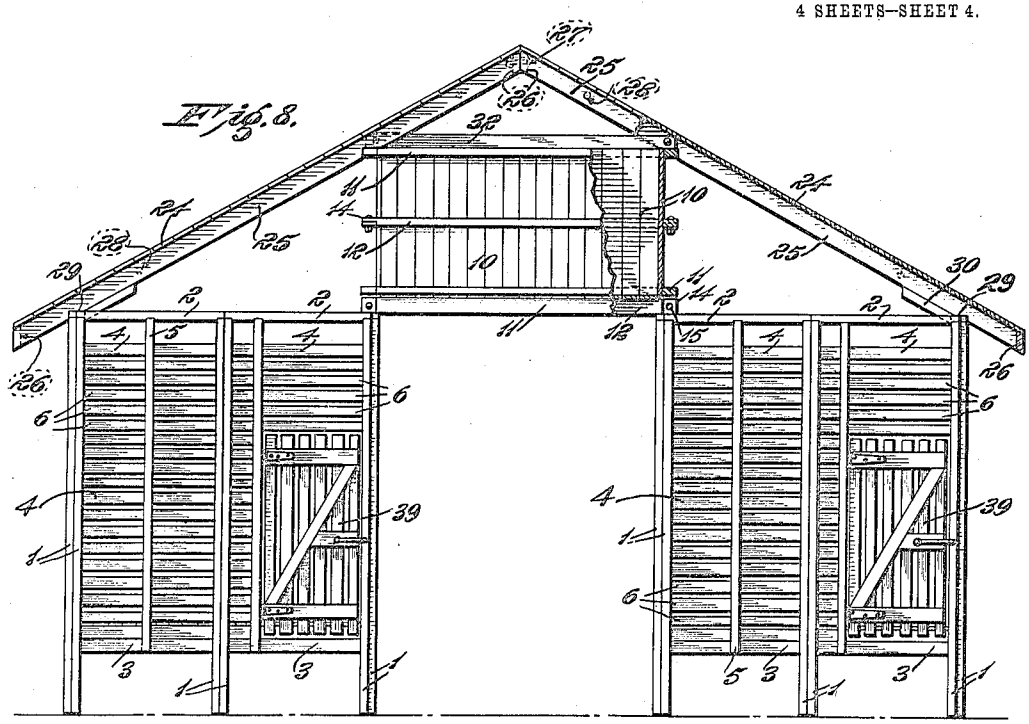


Fig. 9.

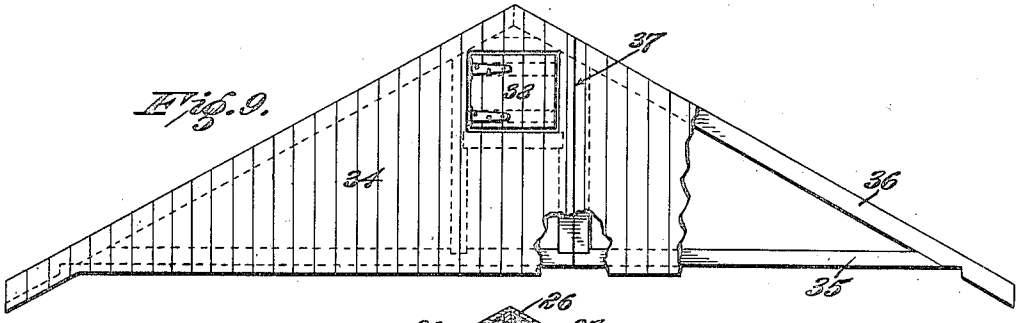
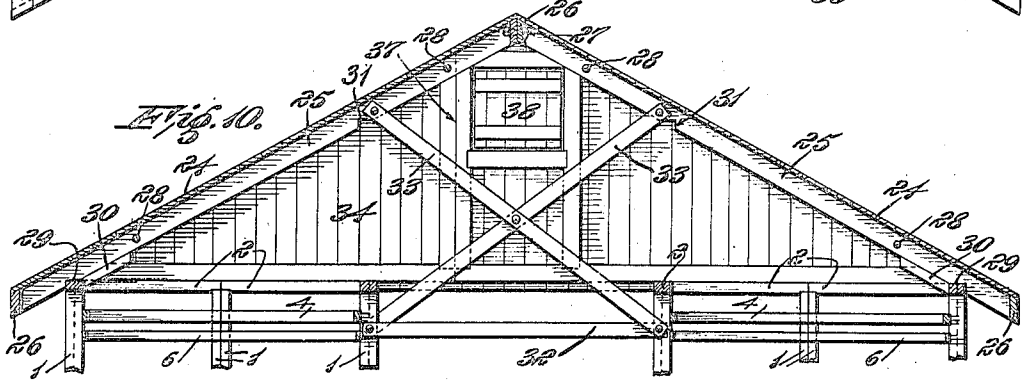


Fig. 10.



Witnesses
Edgar T. Farmer.
G. A. Pennington

Inventor:
Adolph Miller,
By Cameron & Cameron
his attys.

UNITED STATES PATENT OFFICE.

ADOLPH MILLER, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE MILLER MANUFACTURING COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

PORTABLE BUILDING STRUCTURE.

1,075,368. Specification of Letters Patent. Patented Oct. 14, 1913.

Application filed September 3, 1912. Serial No. 718,273.

To all whom it may concern:

Be it known that I, ADOLPH MILLER, a citizen of the United States, and a resident of the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Portable Building Structures, of which the following is a specification.

This invention relates to portable building structures.

It has for its principal objects to produce a system of interchangeable unit sections for the sides, floors, roof, etc., by the use of which buildings of different kinds and sizes may be readily constructed and taken down, and to attain certain advantages which will hereinafter more fully appear.

The invention consists in the parts and in the arrangements and combinations of parts hereinafter described and claimed.

In the accompanying drawings which form part of this specification and wherein like symbols refer to like parts wherever they occur,—Figure 1 is a vertical section of a combined corn crib and grain bin constructed of separable units according to the invention; Fig. 2 is a view partly in top plan and partly in horizontal section in a plane below the grain bin, a portion of the roof being broken away to show the corner connection of the grain bin; Fig. 3 is a vertical section taken on a line at right angles to the line of section of Fig. 1, only the portions adjacent to the bottom and the roof being shown; Fig. 4 is a perspective view of an end roof section; Fig. 5 is a fragmentary plan view of an intermediate roof section; Fig. 6 is a perspective view of a slatted side section; Fig. 7 is a perspective view of a floor section; Fig. 8 is a view partly in front elevation and partly in vertical section of a double corn crib and grain bin structure; Fig. 9 is an outside face view of an end panel for the superstructure; Fig. 10 is a transverse section through a modification of the superstructure shown in Fig. 8; and Fig. 11 is a fragmentary plan view of a special roof section.

The structure shown in Figs. 1 to 7, inclusive, includes practically all the unit sections necessary for a single structure, while in Figs. 8 to 11, inclusive, the additional unit sections for a double structure are illustrated. The single structure will be described first. It includes slatted side panels comprising a frame including upright side members 1, horizontal connecting members 2 secured at their ends to the upper ends of said members 1, and horizontal bottom cleats 3 and intermediate cleats 4 secured to the inner faces of the uprights 1 and preferably mortised therein. The bottom cleats 3 are located some distance above the lower ends of the uprights 1, while the upper intermediate cleats 4 are located a short distance below the top horizontal members 2, the other intermediate cleats 4 being located about midway between said upper ones and the bottom cleats 3. Intermediate upright members 5 complete the frames, they being secured to said top connecting members 2 and cleats 3, 4, in the same manner as the side members 1, the only difference being that said intermediate uprights do not extend below the bottom cleats 3. Slats 6 are secured to the inner faces of said uprights 1 and 5 at regular intervals between the respective cleats 3, 4, preferably by nails, so that they may easily be knocked off as occasion requires. The upright side members 1 have crossed transverse bolt holes 7, 8, therethrough at intervals throughout their length, so that the panels may be either secured together endwise or at right angles to each other; while the intermediate upright members 5 have transverse holes 9 therethrough extending in a plane parallel with the cleats so as to register with bolt holes in end extensions of floor sections or panels to be presently described. Said intermediate upright members 5 are also located to one side of the middle of the panel so as to coöperate interchangeably with either end of the floor panel as will hereinafter more clearly appear. The floor sections or panels 10 are rectangular and comprise flooring strips nailed or otherwise secured to longitudinal marginal cleats 11 and middle cleats 12. The side marginal cleats 11 are provided near each end with transverse holes 13 adapted to register when the floor panels are placed together edgewise so as to receive securing bolts. The middle cleats extend beyond the ends of the floor platform proper, as at 14, and are provided with bolt holes 15, and they are preferably rabbeted, as at 16, the respective end portions being rabbeted reversely. It is

these rabbeted end portions which are secured to the middle uprights 5 of the side panels, and it is to permit placing the cleats 12 at the middle of the floor sections that said uprights 5 are offset from the middle of their respective panels; thus obviating the necessity for making the side panels in "rights" and "lefts". The roof sections are generally rectangular and preferably gabled or inclined on opposite sides from a middle ridge. These sections comprise sheathing 17 nailed or otherwise secured to a transverse ridge pole or middle cleat 18, end cleats 19, and intermediate cleats 20. Longitudinal cleats 21 are also provided. These extend from end to end of the roof section and are crowned to correspond to the pitch of the roof. They are mortised to receive the ends of the cleats 18 and 20 and are framed at their ends with the ends of the end cleats 19, their lower edges being substantially flush with said end cleats 19. The longitudinal cleats 21 are also provided with square notches 22 adapted to receive the upper edge portions of the side panels. There are two patterns of these roof sections. In one style the longitudinal cleat 21 at one side is flush with the edge of the section and the other longitudinal cleat is located some distance inward from the adjacent edge. This kind of section may be termed an "end section". In the other pattern the longitudinal cleats 21 are both flush with the respective edges of the section; and this kind of section may be termed an "intermediate section". In both forms, however, the distance betwen the longitudinal cleats is the same. The only difference is in the widths of the sections, the "end sections" being widened so as to overhang the sides of the building; and the "intermediate sections" being used in a structure requiring more than two roof sections. The portions between the ends of the roof sections and the adjacent notches 22 constitute overhanging eaves which project considerable distance beyond the sides of the building. The flush longitudinal cleats 21 are provided with bolt holes 23 so that the meeting edges of the roof sections may be secured together. The slatted side panels and floor sections are of the same width over all; and the over all length of a floor panel is twice the width less twice the combined thickness of an upright 1 of a side panel and a slat 6. The over all distance between the outer ends of the notches 22 in the longitudinal cleats 21 of a roof section is the same as the over all length of a floor panel plus twice the combined width of a cross member 2 of a side panel and the thickness of a slat 6; and the over all distance between the outer sides of the longitudinal cleats 21 is the same as the over all width of a floor panel or a side panel. Therefore, numerous styles of buildings may be constructed owing to the interchangeability of the several sections. For example, as shown in Figs. 1 to 7, inclusive, the building is for a combined corn crib and grain bin. It comprises a substructure including the slatted side panels, there being two panels used for each side wall. The meeting uprights 1 of each pair of the side panels are secured together by bolts 7^a and the adjoining uprights 1 at the corners of the building being secured together by bolts 8^a. The bottom floor panels are supported at their ends on the bottom cleats 3 of the side panels and the projecting ends 14 of the middle floor cleats are secured to the adjacent intermediate uprights 5 of the side panels by bolts 9^a. The meeting marginal cleats 11 of the floor panels are secured together by bolts 13^a. Floor panels are likewise mounted adjacent to the upper and lower intermediate cleats 4; the uppermost floor sections constituting a bottom for the box-like superstructure or bin whose side walls are made of floor sections set on end, with their marginal cleats 11 resting on the top horizontal members 2 of the lower side panels and secured thereto by bolts 13^b. The overlapping projecting portions 14 of the middle cleats 12 being secured together by bolts 15^a. The roof sections are supported by their cleats 21 whose notched portions 22 are fitted over the cleats 11 and adjacent marginal portions of the sheathing of floor sections constituting opposite side walls of the superstructure or bin, the outer cleats 21 fitting just inside the adjacent side walls. The meeting cleats 21 of the roof sections are secured together by bolts 23^a, and said outer cleats may be nailed to the upper edge portions of the adjacent side wall panels.

The structure may be modified by omitting the middle floor from the corn crib or slatted substructure. It may be further modified by omitting the grain bin or box-like superstructure, and dropping the roof down so that it rests on the cross members 2 of the slatted side panels, thus constituting only a corn crib. Any of these structures may be extended by adding floor sections and side wall sections in the same arrangement and using the intermediate roof sections whose longitudinal cleats 21 are flush with both sides thereof, thus making a long narrow building. Another building may be constructed entirely of floor sections and roof sections. That is, two, four or more (in multiples of two) floor sections may be bolted edgewise together to constitute a floor. Then floor sections in proportionate numbers are set on end as in the superstructure shown in Fig. 1; and in case two or more are required for the long side of an elongated building, the overlapping ends 14 of the middle cleats 12 are fastened to-

gether by bolts 15ª. The roof sections are applied as in the structures hereinbefore described.

Double buildings may be constructed in many styles and sizes by making, for example, first two corn cribs, spacing them apart, and then placing thereover a roof comprising special sections as shown in Figs. 8 to 11, inclusive. These sections comprise sheathing 24 nailed or otherwise secured to a frame comprising longitudinal outer and intermediate cleats 25 and end cleats 26. The sections are beveled at one end so that they may be joined at a ridge. The end cleats 26 are provided with holes to receive securing bolts 27, and the longitudinal cleats 25 are provided with holes to receive securing bolts 28, those in the marginal cleats being adapted to receive bolts which secure the abutting edge portions of two roof sections together, while those of the intermediate cleats are adapted to receive bolts which fasten roof braces or collar beams thereto. The longitudinal cleats are provided with reëntrant portions or right angular notches 29 adapted to receive the upper edge portions of the side wall panels; and adjacent to the inner edges of said notches are thrust blocks 30 which are nailed or otherwise secured to the undersides of the cleats 25, so as to bear against the inner faces of the side panels and resist outward movement of the roof sections which would collapse the roof. The cleats are further provided with notches 31 adapted to receive the upper edge portions of the side wall panels of a box-like compartment or grain bin which may be arranged as a superstructure and support for the roof. These special roof sections like those for a single structure, are made in "end" style with one overhanging marginal portion, and in "intermediate" style with the outer longitudinal cleats flush at both sides. The roof is braced by a collar beam 32 which is bolted at its ends to the intermediate cleats 25 of the roof sections.

By using the special roof sections in connection with the slatted side wall panels and floor sections hereinbefore described many kinds of buildings may be set up, in addition to the double corn crib and superposed grain bin structure just above described. For example, as shown in Fig. 10, the grain bin is omitted from the superstructure, and the roof sections are braced by crossed braces 33 which are bolted at one end to the marginal cleats 25 of the roof sections and at their opposite ends to the uprights 1 of the inner slatted side wall panels; the collar beam 32, in this case being used to connect the adjacent inner walls of the substructure. Another building may be constructed by using the slatted sections for side walls and the special roof sections, making a wider single building. That is by, leaving out the inner walls of the double corn crib structure and filling in the open space between the double cribs shown in Figs. 8 and 10; and many other modifications can be made. Furthermore, a corral or pen may be readily constructed by fastening a multiplicity of the slatted side wall sections together edgewise.

The roof superstructure of the type shown in Figs. 8 and 10, may be closed by end panels 34 comprising sheathing nailed or otherwise secured to a frame including a stringer or beam 35 and inclined sides 36. Preferably this panel is divided on the line 37 for convenience in handling and shipping the sections. In some cases, also, the end panels will be provided with doors 38, in which case the line of separation is preferably to one side of the middle of the panel as shown, but, obviously, where no door is provided the panel may be divided at the middle. Special slatted side wall panels may also be provided with doors 39, so that access may be gained to the interior of any of the structures without knocking off any of the slats 6 as is customary, in some cases, to get into the crib.

In order to prevent mice, rats, and other rodents from climbing and also to protect the projecting lower end portions of the uprights 1 of the side panels, it is preferable to place over them a sleeve of some material which is impervious to moisture and has a glazed and relatively smooth surface. As shown in Figs. 1 to 3, inclusive, the sleeves comprise ordinary drain tiles 40 having their plain ends embedded in a block of concrete 41. Concrete is also filled into the tiles to a considerable height, as at 42. The ends of the uprights 1 rest on these bodies of concrete 42, and sand is filled in around the uprights, as at 43, nearly to the mouth of the bell portion 44 of the tiles, after which a thin slab of concrete 45 is placed thereover to form a seal in order to keep out moisture. This slab 45 may be readily broken and removed in case it is desired to withdraw the uprights from the tiles should it be desired to take the building down. The bell portion 44 of the tile provides an overhanging ledge which serves to prevent a rodent from climbing higher, even should it reach that height. The relatively large cylindrical glazed surface makes it practically impossible for mice and rats to climb.

What I claim as my invention is:

1. In a system of portable building construction, separable wall sections having provision for coupling them together at their vertical margins, and additional separable sections adapted for both floor and wall construction in conjunction with and also without the coöperation of said first-mentioned sections, said second-mentioned sections hav-

ing provisions for coupling them together and for attachment to said first mentioned sections, said first-mentioned sections having means intermediate of the height thereof for supporting said second-mentioned sections in horizontal relation thereto independently of the attaching means.

2. In a system of portable building construction, separable wall sections having provision for coupling them together at their vertical margins, and additional separable sections adapted for both floor and wall construction in conjunction with and also without the coöperation of said first-mentioned sections, said second-mentioned sections having provision for coupling them together at their sides and ends, said first-mentioned wall sections having provision intermediate of the height thereof for interchangeable attachment with said second-mentioned sections through the end coupling provision thereof and having means for supporting the ends of said second mentioned sections in the region of but independently of the attaching means when said second-mentioned sections are used in floor construction, said second-mentioned sections being adapted to be set on edge on top of said first-mentioned sections to constitute a superposed wall, the contiguous edge portions of the coöperating sections having provision for coupling them together.

3. In a system of portable building construction, separable wall sections, and additional separable sections adapted for both floor and wall construction, said second-mentioned sections having marginal cleats along two opposite sides and middle cleats extending beyond the ends thereof, said first-mentioned sections having marginal uprights and cross connecting members at the upper ends and near the lower ends thereof and also intermediate said upper and lower members, said sections also having intermediate uprights located to one side of the middle corresponding to the thickness of the end extensions of the middle cleats of said second-mentioned sections so as to overlap coöperatively in one manner with the extension at either end of one of said second-mentioned sections and having provision intermediate of the height thereof for attachment to the respective extensions in of said first-mentioned sections, said cross connecting members being arranged and adapted to support the ends of said second-mentioned sections in horizontal relation thereto independently of the means of attachment between the midlde cleat extensions of said second-mentioned sections and the intermediate uprights of said first-mentioned sections, the marginal uprights of said first-mentioned sections having provision for attaching said sections together edgewise to constitute a common wall and also at right angles to each other at the corner of two walls, the marginal cleats of said second-mentioned sections having provision for attaching said sections together edgewise and also for attaching them to the upper cross members of said first-mentioned sections when set on edge thereon to constitute a superposed wall section, and the end extensions of said middle cleats of said second-mentioned sections having provision for attachment to each other when said sections are used for side walls.

4. In a system of portable building construction, separable wall sections having provision at their vertical margins for coupling them together in a plane and also when arranged at right angles to each other. and additional separable sections adapted for both floor and wall construction in conjunction with and also without the coöperation of said first-mentioned sections, said second-mentioned sections having provision at their sides for coupling them together when arranged in a plane, and having extensions at their ends adapted to be secured to said first-mentioned sections when said second-mentioned sections constitute a floor, said end extensions being also adapted to be secured together when the sections are stood vertically on their sides, and the coupling provision at the sides of said second-mentioned sections being adapted to coöperate with similar provision at the tops of said first-mentioned sections when placed thereon to constitute a superposed wall section.

Signed at St. Louis, this 31st day of August, 1912.

ADOLPH MILLER.

Witnesses:
G. A. PENNINGTON,
PAULINE AMBERG.