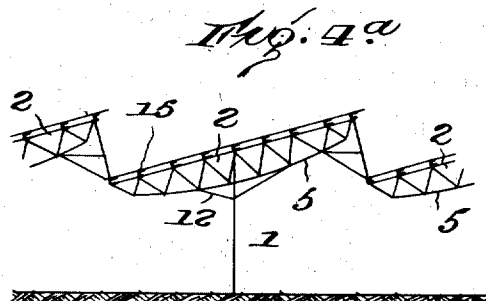
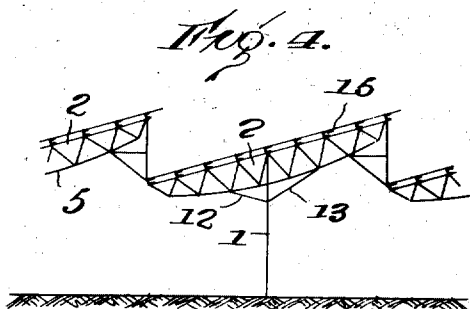
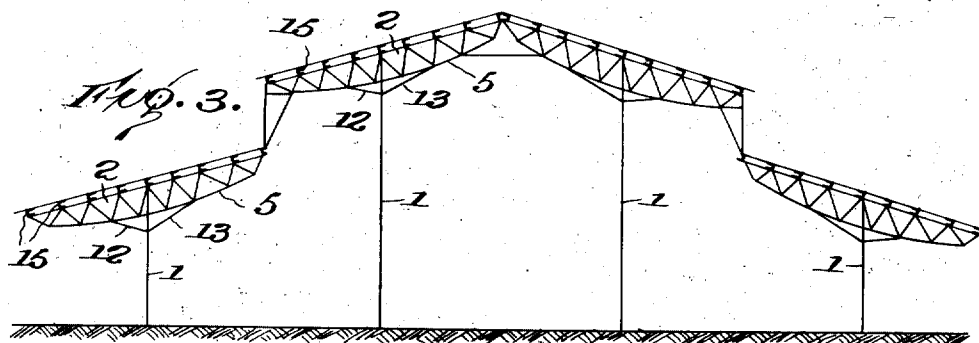
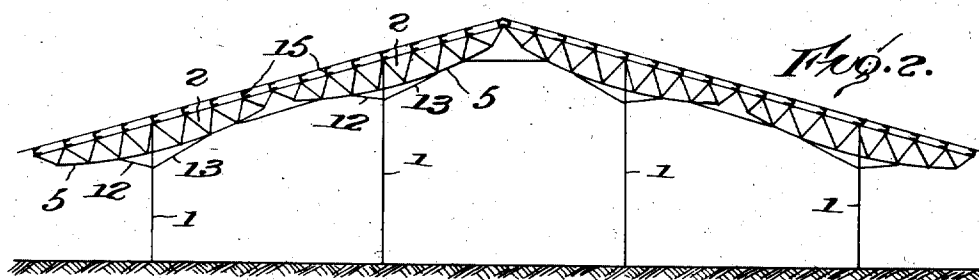
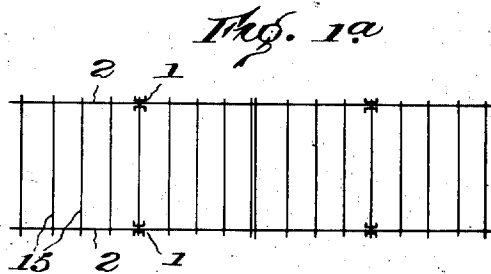
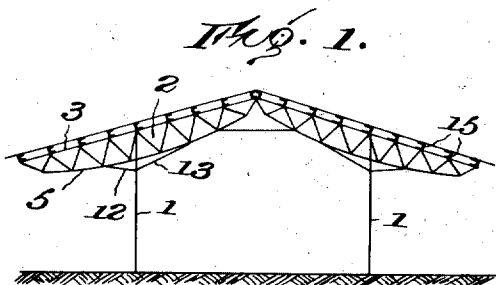


1,250,031.

W. C. SCHNABEL.
BUILDING CONSTRUCTION UNIT.
APPLICATION FILED MAY 26, 1917.

Patented Dec. 11, 1917.

2 SHEETS—SHEET 1.



Inventor

William C. Schnabel,

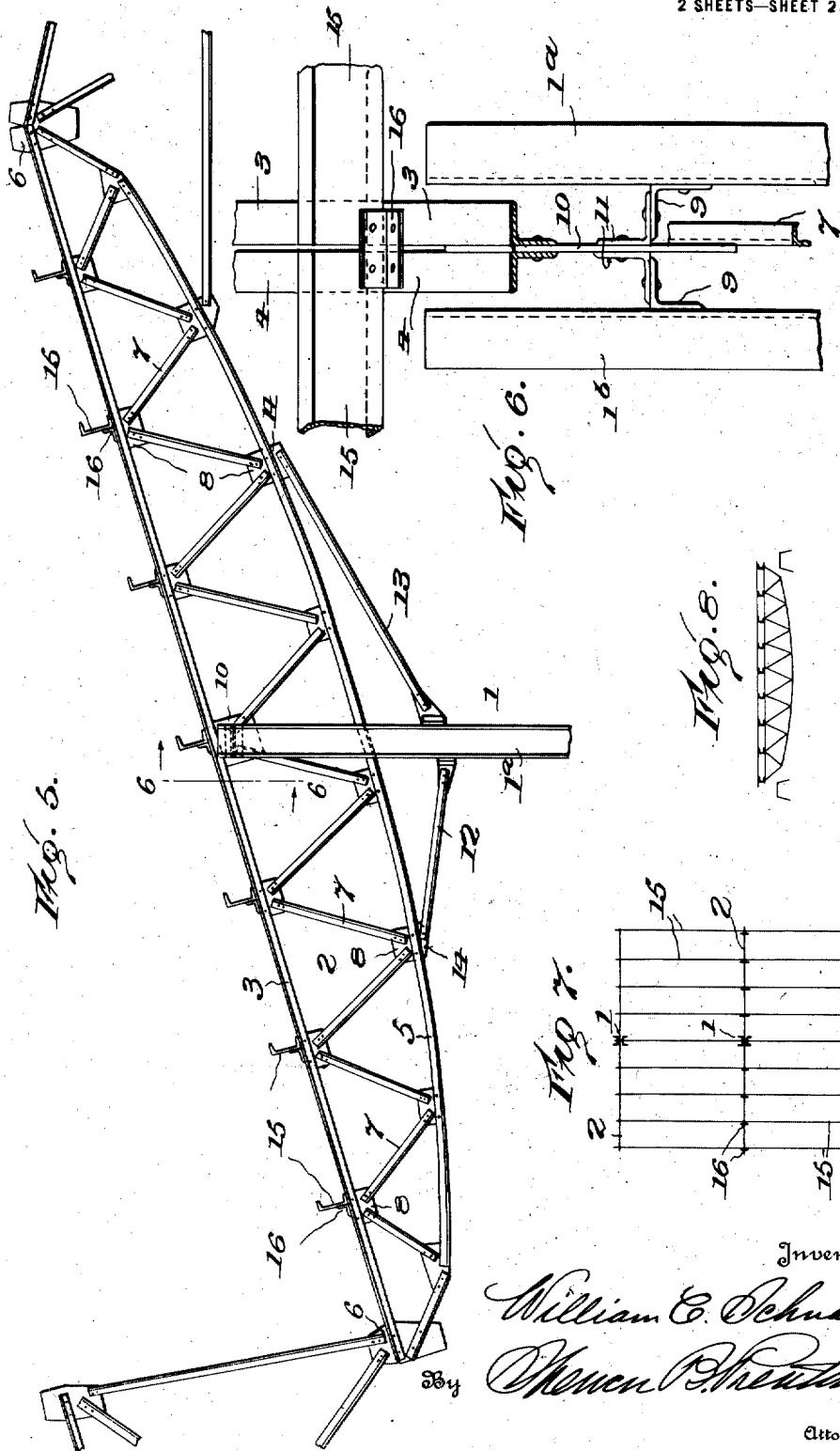
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2 SHEETS—SHEET 2.



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BUILDING-CONSTRUCTION UNIT.

1,250,031.

Specification of Letters Patent.

Patented Dec. 11, 1917.

Application filed May 28, 1917. Serial No. 171,072.

To all whom it may concern:

Be it known that I, WILLIAM C. SCHNABEL, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented new and useful Improvements in Building-Construction Units, of which the following is a specification.

This invention relates to building construction in general and pertains particularly to a unit system of roofing and roofing support in which the several units are formed of balanced truss and support members.

One object of the invention is to provide a self balancing light weight truss and truss support structure which is particularly adapted for use in roof construction, bridge construction, and other uses where by a simple multiplication of units any desired area or type of roof may be obtained.

Another object of the invention is to provide a light weight balanced structure particularly adapted for use in the construction of hangars for aeroplanes, sea-plane sheds, armories and storehouses.

A further object of the invention is to provide a light weight unit for roof construction which may be quickly and easily erected and which may be supplemented by the fastening thereto of additional units.

A further object of the invention is to provide a type of construction unit of the knock-down variety which shall be desirable for a great number of possible uses and which should have interchangeable parts and be carried in stock in large numbers for immediate distribution and erection.

The invention provides an inherently balanced truss and post or column unit formed of light weight structural material. The unit includes a truss member, preferably of the bow and string type, supported by a post or column. As illustrated and described herein the truss members have diagonal bracing members arranged in triangular angles, but vertical or other bracing means may be used. This truss member is supported by the column or post at the middle of the top chord or string. This construction, by balancing the truss about the supporting column greatly reduces the stresses resulting from the weight of the structure itself and also the stresses resulting from applied loads. By rotation of the truss on the post the slope of the roof or the inclination of the truss to the vertical may be

changed without altering the design of the unit, different length tie rods and adjustment of the supporting means between the post and truss being the only changes necessary. The construction provides for two units to each area of roof and a plurality of connecting members or purlins joining the parallel trusses. When it is desired to add additional units of roofing surface it is necessary merely to add one additional truss and support unit and connect the same to the adjacent truss by means of the purlins. The parts of the unit may be of any size and the space between the columns or posts is governed by the length of the purlins to be used. The angle of the truss with respect to the supporting column is governed by the use of different length tie rods extending from the column or post to the truss member on either side of the point of support. If it is desired to use the units as bridge trusses for the conveying of large bodies of troops, the purlins and the straight side of the truss member may be used as the horizontal bridge surface, the purlins constituting floor stringers.

Referring to the drawings—

Figure 1 shows diagrammatically the unit construction arranged to form a double pitched roof having a two span width.

Fig. 1* represents diagrammatically a plan view of the structure shown in Fig. 1.

Fig. 2 shows a construction arranged as that described in Fig. 1, but having an extra unit added to each side of the centerline to increase the width.

Fig. 3 shows an arrangement having a monitor type roof with the central unit sections raised and having longer columns than the columns of the side section.

Fig. 4 shows the unit construction as adapted to one type of saw-toothed roof.

Fig. 4* shows an adaptation for a different type of saw-toothed roof.

Fig. 5 is an enlarged view of the column and truss unit.

Fig. 6 is an enlarged fragmentary view taken on the line 6—6 of Fig. 5.

Fig. 7 is a diagrammatic view showing two units of area arranged side by side.

Fig. 8 is a side view of an adaptation of the truss member for bridge construction, the purlins constituting the floor stringers of the bridge.

Referring in detail to drawings 1 rep- 110

resents a supporting column or post formed of vertical members 1^a and 1^b, shown as channel members, arranged web to web and spaced apart to provide for the mounting of a truss member 2 near the top of the channel members and between the same. The members 1^a and 1^b may be mounted on suitable concrete foundations. The truss member 2 is illustrated in Figs. 5 and 6 as formed of light angle material arranged in parallel lengths and designed preferably as a bow and string type. The upper and straight side or chord of the truss is formed of the angle members 3 and 4. The lower side or bow of the truss is correspondingly formed of two angles, members 5 and its complementary part, not illustrated. The ends of the members 3 and 4, and 5 and its complementary members are joined by suitable plate members 6 commonly known as gusset plates. Diagonal bracing members 7 extend between the parts 3 and 4 and the lower side 5 and are fastened to suitable gusset plates 8 fastened between the upper angle members 3 and 4 and between the member 5 and its complementary angle member. The complete truss member 2 is mounted on the column 1 in the following manner. Angle iron brackets 9 are fastened to the adjacent web faces of the vertical members 1^a and 1^b, as illustrated in Fig. 6. At approximately the middle point of the upper side of the truss 2 a gusset plate 10 is fastened between the angle members 3 and 4. This gusset plate projects downwardly and carries two laterally extending angle members 11 which are adapted to rest on and to be fastened to the angle members 9 carried by the vertical members of the post. The tie rods 12 and 13 extend from the gusset plates 14 carried by the lower side of the truss to the vertical members of the column 1.

All fastenings between the truss and the column are designed to be made by means of bolts and nuts and not by rivets so that the structure will be easily torn down and moved from place to place for reconstruction. It will be clear that the inclination of the truss on the column may be varied by using the tie rods 12 and 13 of different lengths.

In completing one unit section of roof area it is necessary to have two truss and column units arranged parallel and to connect the same by a plurality of purlin members 15 formed of channel material and which are adapted to rest on the upper surfaces of the truss members 3 and 4 of the truss 2 and to be fastened by means of small angle members 16. Where a plurality of units of area are desired, each additional unit of area may be had by adding one extra truss and column unit and uniting the same with the other units by means of additional purlin members 15. In the latter case the purlins 15 should rest on and terminate on the ad-

jacent angle part of the truss 2 and should not extend completely across the whole upper surface of the truss.

Where additional and extraordinary space is required between the vertical supporting columns, as may be the case where the structure is to be used for an aeroplane hangar, it is advisable to insert between adjacent columns a truss member arranged in a vertical plane so that the structure may be rigid and the weight of the entire roof may be carried by the longitudinal truss which takes the place of intermediate columns and makes it unnecessary to place any great strain on the connecting purlins. In the types of construction in which the units of area are built end to end as shown in Figs. 1, 1^a, 2 and 3, the connections between the ends of the truss members may be made by means of a pin or bolt so as to provide a hinged joint or may be made rigid by means of a plurality of bolts and a gusset plate. The units may be used to advantage for providing a housing which may be quickly erected for quarters for large bodies of troops. As shown in Figs. 7 and 8 the units may be used for light bridge construction, the purlin members being used as floor stringers. Throughout the construction described the width or length of the units of area may be regulated at will by the simple introduction of additional units or the use of different length parts in individual units.

The construction provides combinations possible by using any number of units which are identical and therefore interchangeable. Changes in material and size of the parts may be made without departing from the scope of the invention. The purlins are not necessarily made of channel members but may be made of other forms of steel or of wood. The invention includes the covering for the structure which may be made of plain sheets of material or of corrugated iron or other metal. The construction provides a self-balanced frame which is designed to be strictly self-supporting.

What I claim is:

1. A balanced truss and support structure comprising two vertical support members spaced apart and constituting a post, a truss member between said vertical support members and extending laterally to either side of the same and fastened to and balanced on said post at substantially the middle point of the upper side of said truss, and lateral fastening means between the post and the truss, connected to the truss at a point spaced from said post, and connected to the post at a point below said truss.

2. A balanced truss and support structure comprising two vertical support members spaced apart and constituting a post, a truss member lying between said vertical support members and extending laterally to either

side thereof and fastened to and balanced on said post at a point above the center of gravity of the truss, connective fastening means between adjacent faces of said vertical members holding said truss to said post, and a lateral tie rod beneath said truss and on each side of said post, said tie rods being connected to said truss at a point spaced laterally from said post and connected to said post at a point below said truss.

3. A balanced truss and support structure comprising two vertical support members spaced apart and constituting a post, a truss member fastened to and balanced on said post and extending between the vertical members of said post laterally on either side thereof, connective means fastening said truss to said post comprising a lateral support member on each adjacent face of said vertical support members, a central vertical web member carried by said truss at the center of the upper side thereof, connecting means between said vertical support members for fastening said web member to said vertical support means, and a lateral tie rod beneath said truss and on each side of said post, each rod being connected to said truss at a point spaced laterally from said post and connected to said post at a point below said truss.

4. A balanced truss and support structure comprising two vertical channel members arranged web to web and spaced apart and constituting a post, a truss member fastened to and balanced on said post and extending laterally between said vertical members and on either side thereof, connecting means fastening said truss at a point above the center of gravity thereof to said vertical members, and a lateral tie rod beneath said truss and on each side of said post, each rod being connected to said truss at a point spaced laterally from said post and connected to said post at a point below said truss.

5. A balanced truss and support structure comprising two vertical channel members spaced apart and constituting a post, a truss member fastened to and balanced on said post and extending laterally between said vertical members and on either side thereof, connecting means fastening said truss to said vertical members comprising a lateral support member on each adjacent face of said vertical members, a central vertical plate member carried by said truss in the central upper part thereof, connecting means fastening said plate members to said lateral support members on the adjacent faces of said vertical members, and a lateral tie rod beneath said truss and on each side of said post, each rod being connected to said truss at a point spaced laterally from said post and connected to said post at a point below said truss.

6. A building construction unit compris-

ing two self-balanced members, each consisting of a balanced truss and support structure comprising two vertical support members spaced apart and constituting a post, a truss structure fastened to and balanced on said post at a point adjacent the upper side of said truss and extending between said vertical support members and laterally on either side thereof, and fastening means between said vertical members connecting said truss to said post, a lateral tie rod beneath said truss and on each side of said post, each rod being connected to said truss at a point spaced laterally from said post and connected to said post at a point below said truss, and a plurality of horizontal and parallel connecting members fastened to and extending between said truss members.

7. A building construction unit comprising two self-balanced members, each comprising two vertical support members spaced apart and constituting a post, a truss member fastened to and balanced on said post at a point adjacent the upper side of said truss and extending between said two vertical support members and laterally on either side thereof, and means for fixedly fastening said truss to said vertical support members, a lateral tie rod beneath said truss and on each side of said post, each rod being connected to said truss at a point spaced laterally from said post and connected to said post at a point below said truss, and a plurality of horizontal and parallel connecting members fastened to said truss members and extending between the same.

8. In a building construction system, a plurality of self-balanced members, each comprising two vertical support members spaced apart and constituting a post, a truss member fastened to and balanced on said post at a point adjacent the upper side of said truss and extending between said two vertical support members and laterally on either side thereof, means for fixedly fastening said truss to said post, a lateral tie rod beneath said truss and on each side of said post, each rod being connected to said truss at a point spaced laterally from said post and connected to said post at a point below said truss, and a plurality of horizontal and parallel connecting members fastened to and extending between said truss members, each connecting member extending to and terminating at the center of the upper surface of the truss members to which it is connected.

9. In a building construction system, a knock-down roof and roof support structure comprising a plurality of supporting posts having two vertical members spaced apart, a truss member mounted between said vertical members and at a point adjacent the upper side of said truss member and balanced on each supporting post, a lateral tie rod

beneath said truss and on each side of said post, each rod being connected to said truss at a point spaced laterally from said post and connected to said post at a point below said truss, and a plurality of parallel connecting purlins fastened to adjacent truss members, each adjacent pair of supporting posts, trusses and connecting purlins constituting a unit of area, additional units of area being provided by each additional post, truss and connecting purlins.

10. A balanced truss and support structure comprising a supporting post having its upper portion comprising two upwardly projecting supporting members positioned apart, a truss member between said vertical supporting members and extending laterally to either side of the same and fastened to and balanced on said post at substantially the middle point of the upper side of said truss, and lateral fastening means between the post and the truss, connected to the truss at a point spaced from said post, and con-

nected to the post at a point below said truss.

11. A balanced truss and support structure comprising a supporting post having its upper portion comprising two upwardly projecting support members positioned apart, a truss member lying between said vertical support members and extending laterally to either side thereof and fastened to and balanced on said post at a point above the center of gravity of the truss, connective fastening means between adjacent faces of said vertical members holding said truss to said post, and a lateral tie rod beneath said truss and on each side of said post, said tie rods being connected to said truss at a point spaced laterally from said post and connected to said post at a point below said truss.

In testimony whereof I have hereunto set my hand.

WILLIAM C. SCHNABEL.