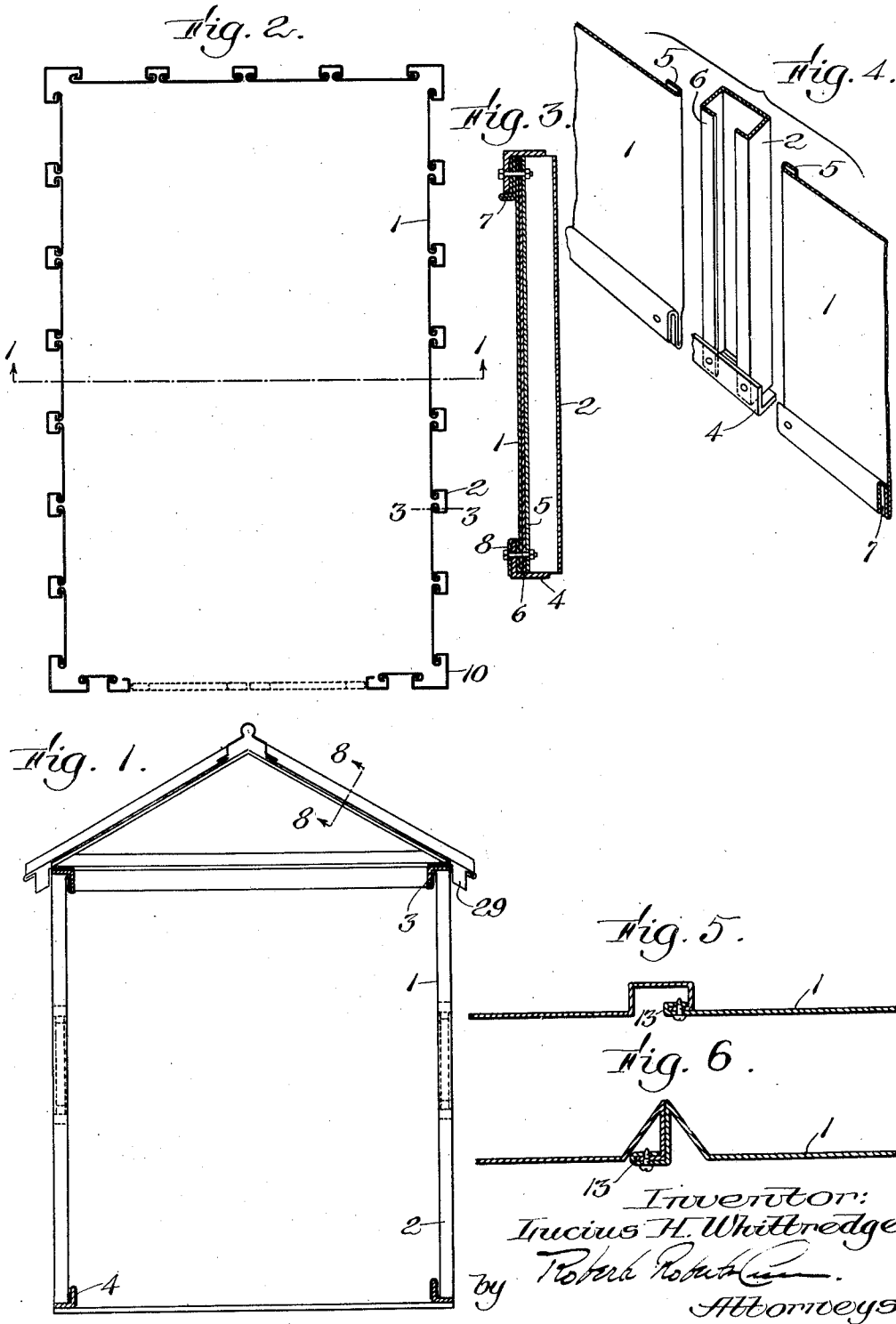


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METALLIC BUILDING STRUCTURE.
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1,356,950.

Patented Oct. 26, 1920.

2 SHEETS—SHEET 1.



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1,356,950.

2 SHEETS—SHEET 2.

Fig. 12 is a cross-sectional view of the mechanical assembly. It shows a central component 22 with a rectangular block 26 on top. A vertical rod 27 passes through the center of block 26 and component 22. A horizontal rod 24 is positioned below component 22. A base 25 is at the bottom. A vertical support 28 is on the left. A horizontal rod 23 is on the right. A vertical rod 21 is on the far right. A horizontal rod 20 is at the bottom. A vertical rod 19 is on the left. A horizontal rod 18 is at the top. A vertical rod 17 is on the right. A horizontal rod 16 is at the bottom. A vertical rod 15 is on the left. A horizontal rod 14 is at the top. A vertical rod 13 is on the right. A horizontal rod 12 is at the bottom. A vertical rod 11 is on the left. A horizontal rod 10 is at the top. A vertical rod 9 is on the right. A horizontal rod 8 is at the bottom. A vertical rod 7 is on the left. A horizontal rod 6 is at the top. A vertical rod 5 is on the right. A horizontal rod 4 is at the bottom. A vertical rod 3 is on the left. A horizontal rod 2 is at the top. A vertical rod 1 is on the right.

Fig. 11 is a perspective view of the mechanical assembly. It shows a central component 22 with a rectangular block 26 on top. A vertical rod 27 passes through the center of block 26 and component 22. A horizontal rod 24 is positioned below component 22. A base 25 is at the bottom. A vertical support 28 is on the left. A horizontal rod 23 is on the right. A vertical rod 21 is on the far right. A horizontal rod 20 is at the bottom. A vertical rod 19 is on the left. A horizontal rod 18 is at the top. A vertical rod 17 is on the right. A horizontal rod 16 is at the bottom. A vertical rod 15 is on the left. A horizontal rod 14 is at the top. A vertical rod 13 is on the right. A horizontal rod 12 is at the bottom. A vertical rod 11 is on the left. A horizontal rod 10 is at the top. A vertical rod 9 is on the right. A horizontal rod 8 is at the bottom. A vertical rod 7 is on the left. A horizontal rod 6 is at the top. A vertical rod 5 is on the right. A horizontal rod 4 is at the bottom. A vertical rod 3 is on the left. A horizontal rod 2 is at the top. A vertical rod 1 is on the right.

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UNITED STATES PATENT OFFICE.

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METALLIC BUILDING STRUCTURE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, LUCIUS HENRY WHITTREDGE, a citizen of the United States, and resident of Lynn, in the county of Essex and State of Massachusetts, have invented new and useful Improvements in Metallic Building Structures, of which the following is a specification.

My invention relates to the structure of a metal building which I have designed primarily for use as a garage, although it is obviously adapted to be used for other purposes.

The principal objects of my invention are to provide a structure which is stiff and rigid, yet light in weight and requiring a minimum of material, which has tight and substantially moisture proof joints, which is substantial and durable in construction, which may be easily and quickly assembled by unskilled labor, which may be readily extended in length by removing one end and inserting a few standard parts, and which has a minimum number of fastening devices, all of which are located on the interior of the building where they are unexposed to the weather, thus affording a plain and attractive exterior appearance. Other objects of my invention will be apparent from the specification and accompanying drawings, in which—

Figure 1 is a vertical section of the building taken on the line 1—1 of Fig. 2;

Fig. 2 is a horizontal section of the vertical portion of the structure;

Fig. 3 is a vertical sectional detail view on line 3—3 of Fig. 2 showing the manner in which the side sheets are attached to the upright posts, top plate and sill;

Fig. 4 is a perspective view of a section of a side of the building with the side sheets, vertical post and sill spaced apart;

Figs. 5 and 6 are horizontal sectional views of modified means for attaching the side sheets together;

Fig. 7 is a horizontal sectional view of a portion of the roof taken on line 8—8 of Fig. 1;

Fig. 8 is a perspective view of a section of the roof;

Fig. 9 is a perspective view of a portion of a T-shaped rafter together with clips for attaching the rafters to the ridge-roll;

Fig. 10 is a longitudinal sectional view of the connection between the rafter and ridge-roll taken parallel to the sloping roof;

Fig. 11 is a view of a section through a flange of a rafter in a plane parallel with the vertical rib of the rafter showing one form of connecting means for securing the rafters to the top of the side walls; and

Fig. 12 is a sectional view of the said connecting means, taken on the line 13—13 of Fig. 11.

In the embodiment of my invention illustrated by way of example in Figs. 1 to 4, the walls of the building are made up of side sheets 1, which are secured at their vertical edges to upright hollow posts 2, and at their upper and lower edges respectively, to the angular top plate 3 and angular sill 4. The vertical edges of the side sheets are folded outwardly as at 5, to fit over the flanges 6 on the upright posts, and the horizontal edges are folded inwardly in the manner shown at 7 and 8 in Figs. 3 and 4 to form a tight connection between the side sheets and the top plate 3 and sill 4. The side sheets, upright posts and angular members 3 and 4 are secured together by means of bolts or other fastening means 9, each of which passes through a fold 5 of a side sheet, a flange 6 of an upright post, a side sheet 1, a fold 7 or 8, and the top plate 3 or sill 4. The corner posts 10 are similar to the posts 2 except that they are larger and have an additional right angle bend at their longitudinal center.

In the modifications shown in Figs. 5 and 6, the upright posts are omitted entirely and the vertical edges of the side sheets are bent to form a cooperating tongue and groove connection 13 which is maintained by means of screws.

The roof structure shown in Figs. 7 to 10 comprises rafters 14 adapted to rest on the top plates 3 shown in Fig. 1 and supporting roof sheets 15 and ridge-roll 16. The rafters may be T-shaped as shown in Fig. 9, L-shaped as shown at 14' in Fig. 8, or flat as shown at 14² in Fig. 7, or of any form having comparatively great bending strength in a vertical direction and having a suitable vertical longitudinal portion to receive the roof sheets which have channels 18 formed along their sloping edges to fit over the rafter.

The ridge-roll has openings cut in the portions 11 and 12 to receive the upper ends of the rafters which project a short distance within the ridge roll and are attached thereto by means of clips 17 which are prefer-

ably manufactured in the form shown in Fig. 9. In securing the ridge roll to the rafters, to which the roof sheets have previously been applied, one clip is attached to each side of each rafter by means of a bolt 48, for example; the ridge roll is placed in position as shown in Fig. 8 with the folded portions 19 of the clips bearing against the inner surfaces of vertical portions 20 of the ridge roll and the ends 21 of the clips are then bent outwardly to bear against the outside surfaces of the vertical portions 20. Bolts 36 may be employed to secure the portions 19 and 21 of the clip 17 to the vertical portion 20 of the ridge roll, as shown in Fig. 10, although these bolts may be omitted as shown in Fig. 8 when employing clips of sufficient thickness to rigidly clamp the ridge roll between the folds 19 and 21.

The upright posts 2 and rafters 14 are preferably similarly spaced apart so that the rafters are respectively positioned directly over the uprights. One means of connecting the rafters to the top plates 3, shown in Figs. 11 and 12, comprises two angular members 22 and 23 having lower flanges 24 and 25 resting on and bolted to top plate 3 and having upper sloping flanges 26 and 27 supporting and bolted to the rafters. The members 22 and 23 are spaced apart to receive the cross bars 28 which extend across the building.

As shown in Figs. 1 and 12, a channel shaped member 29 extending the full length of the building and having a flange 30 at its outer edge may be secured between the top plate 3 and connecting means 22—23. This channel shaped member adds rigidity to the building and the flange 30 affords means about which the edges of the roof sheets may be folded to give a neat and tight connection between the roof and walls. Furthermore, the vertical portion 31 of the channel member 29 simulates the appearance of the ordinary building constructed of wood.

Each of the gables of the building including end portion 32, sections 33 of the roof and section 34 of the ridge roll, are preferably integrally constructed, for example, by welding together two or more suitably formed parts. In the assembled building the section 34 of the ridge roll laps over the main ridge roll 16 as shown at 35, and the inner edge of roof sections 33 are folded over the first rafters in the same manner as the roof sheets 15 are fitted to the rafters. Thus the work of assembling the structure is facilitated, and a style ordinarily requiring skilled labor to assemble is attained. The upright posts formed of sheet material of suitable thickness into hollow members of angular cross section afford a stiff construction adapted for either small or large buildings. The posts are so shaped that

side sheets of any weight or thickness can be easily attached thereto. The folds at the four edges of the side sheets afford a simple means of tightly locking the sheets into the uprights, sills and top plates, and also add stiffness and rigidity to the building. The fold connections are substantially airtight and moisture proof, and there are no exterior crevices or seams into which water will run by gravity.

The vertical longitudinal ribs on the rafters permit the folded roof sheets to be securely locked thereto, the folds being at right angles to the sheets thus stiffening the roof. The folds not only fit snugly over the rafters but the channel-shaped section of a roof sheet fitting accurately between two adjacent rafters further strengthens the structure. The upright posts and rafters being similarly spaced, with the rafters positioned over the posts, the weight of the roof is carried directly by the posts, and moreover the length of the building may be suitably varied by inserting or removing the desired number of standard units of wall and roof sections. By folding the lower edges of the roof sheets underneath the longitudinal channel members, a weather proof connection between the roof and wall is secured.

It will be noted that the fastening devices throughout the entire building are located wholly on the interior, thus eliminating unsightly fastening heads on the exterior, making the fastenings inaccessible from the outside and protecting them from adverse weather conditions. Moreover, owing to the fact that no holes need be made through the walls or roof for the fastening devices a troublesome source of leakage and rusting is eliminated.

What I claim is:

1. A metallic building comprising a plurality of sheets, channel members having flanges parallel with said sheets, folds on said sheets interlocking with said flanges, and fastening means extending through said flanges and folds with their outer ends disposed wholly within said channel members.

2. A metallic building comprising a plurality of sheets, channel members having longitudinal intumed flanges parallel with said sheets, folds on said sheets interlocking with said flanges, and bolts extending through said flanges and folds, said flanges being spaced away from the outside wall of the channel member sufficiently to receive the heads of the bolts therebetween, whereby said sheets and channels may be secured together without the bolts extending outside the building.

3. A metallic building structure comprising an upright post having longitudinal flanges, side sheets having folds at their vertical edges interlocking with said flanges,

horizontal members, said sheets being folded at their edges and interlocking with said members, and fastening means each passing through one each of said flanges, said sheets, 5 and said members.

4. A metallic building structure comprising a plurality of alined wall sheets having their adjacent edges folded outwardly through 180° into parallelism with the respective sheets and having their lower edges 10 folded upwardly through 180° and then downwardly through 180°, whereby a base member may extend upwardly under the last said fold and a connecting member may 15 be fitted under said first folds.

5. A metallic building structure compris-

ing a plurality of alined wall sheets having their adjacent edges folded outwardly through 180° into parallelism with the respective sheets and having their lower edges 20 folded upwardly through 180° and then downwardly through 180°, a base member extending upwardly under the last said fold, a connecting post having inturned flanges fitting under said first folds respec- 25 tively, and fastening means extending through one of said flanges, said base member and all of said folds at the lower corners of the wall sheets.

Signed by me at Boston, Massachusetts, 30 this 18th day of April, 1916.

L. HENRY WHITTREDGE.