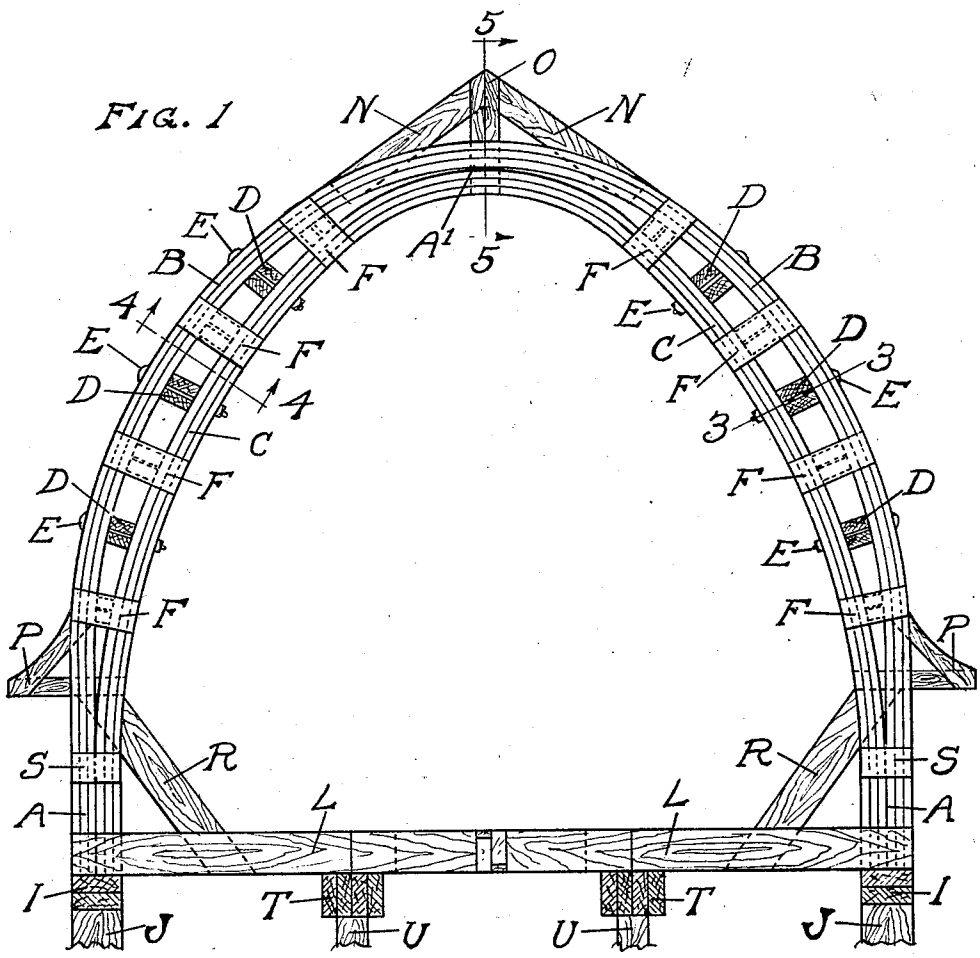
April 8, 1930. A. C. JOHNSON 1,753,862

ROOF STRUCTURE

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FIG. 1



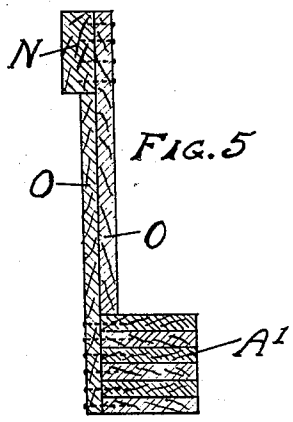


FIG. 5

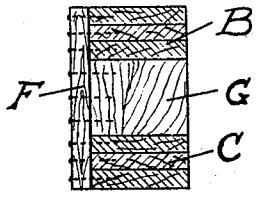


FIG. 4

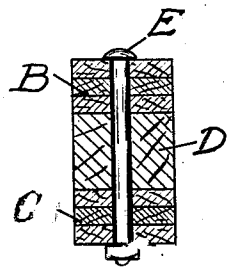


FIG. 3

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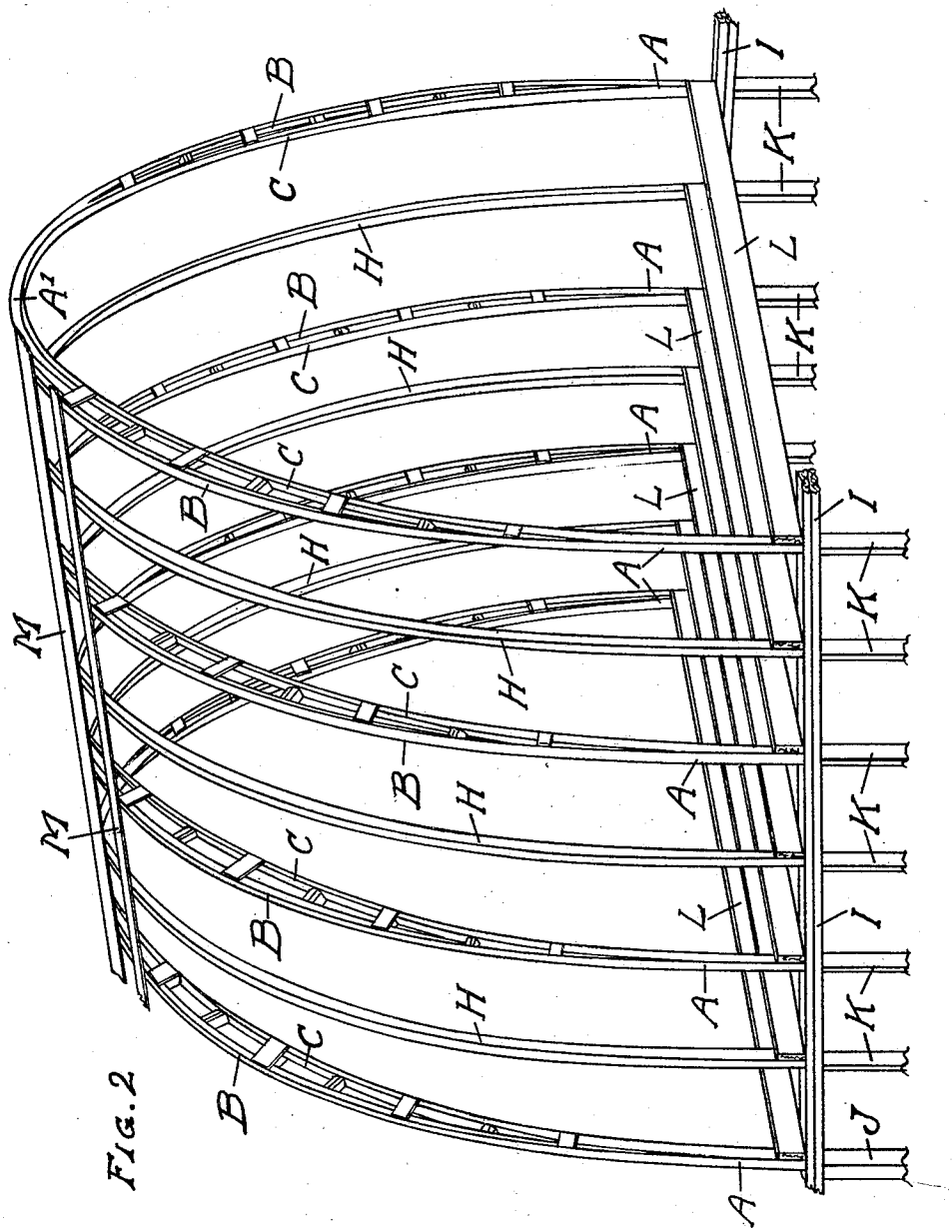


FIG. 2

Inventor
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Patented Apr. 8, 1930 1,753,862

UNITED STATES PATENT OFFICE

ALBERT C. JOHNSON, OF FAIRFIELD, IOWA, ASSIGNOR TO THE LOUDEN MACHINERY COMPANY, OF FAIRFIELD, IOWA, A CORPORATION OF IOWA

ROOF STRUCTURE

Application filed December 3, 1927. Serial No. 237,485.

My invention relates to the structures which carry the roof boards, and the covering forming the roof. There are specially adapted for barns having hay mows and for other buildings requiring a large vertical space immediately under the roof, which space should be free of braces or other supporting means, especially in the central parts; and it consists of a series of roof structures formed of laminated members curved in an approximately semi-elliptical formation which are continuous from one side of the roof to the other, and have their ends and their central portions closely connected together for some distance, while the portions between the ends and the center are spaced apart and strengthening means are inserted in said spaces. Also, of other improved features which will be hereafter explained and duly set forth in the claims.

In the accompanying drawings forming a part of this specification, Fig. 1 is a side elevation of one of these structures embodying my invention, as it would appear when set on the frame of a building, and when viewed from an end of the building. Fig. 2 is a perspective of a number of said structures set on the frame of a building with a couple of roof boards applied thereto, some of the details being omitted in this figure. Fig. 3 is an enlarged transverse section on line 3—3 of Fig. 1. Figs. 4 and 5 are the same on lines 4—4 and 5—5 of Fig. 1, looking in the direction of the arrows in both figures.

Referring to the drawings, A represents the ends and A′ the central portions of the structure which are continuous from end to end and are composed of two laminated members B and C, as most plainly shown in Fig. 1, and which are made and joined together as hereafter explained. Having the strips of lumber to form the laminated members B and C, the first thing will be to drive a series of stakes in the ground, or fasten a series of blocks on a floor, if a floor is available, said stakes or blocks being arranged to form the desired inside curve of the member C. This arrangement of the stakes or blocks will be readily understood by those skilled in the art without showing them in the drawings. Then place the end of a strip against one of the end stakes or blocks and tack it there to hold it, following this by tacking the strip to the adjacent stakes or blocks, and bending it as may be necessary to form the curve.

Next, place another strip against the adjacent stakes or blocks with one of its ends abutting the adjacent end of the first strip, and tack it fast to said adjacent stakes or blocks. Then follow this with additional strips, tacking them fast until the other end stake or block on the opposite side is reached, when the end of the last strip is to be sawed off, if necessary, to make it the proper length. After this has been done, apply the second series of strips, commencing at either end desired, being sure to break joints and nail the second series of strips securely to the first series. Another series of strips should then be added in the same manner to make the three ply laminated member C, shown in the drawings. Usually three strips will be sufficient but additional strips may be added to make an extra strong structure.

The next thing will be to place the blocks D against the outer strips of the inner member C, tacking them fast and spacing them apart substantially as shown in Fig. 1. When this is done, the inner series of strips of the outer member B are to be applied, nailing their outer ends and central portions securely for some distance to the member C, as shown in Fig. 1, and tacking the intermediate portions between the ends and the central portions to the blocks D to hold the strips in place. After this apply the other strips of the member B as explained for the additional strips of the member C. Then bore holes in the blocks D, and through the members B and C, and insert the bolts E therein. The central blocks D should be wider than the others to make the space between the members B and C taper until the members will be in direct contact with each other for some distance at the ends and also in the central portions.

To more thoroughly strengthen the structure, cleats F are securely spiked on the sides of the members B and C at a number of places, as shown in Fig. 1, and in the open

spaces between the members under the cleats F, blocks G may also be inserted, as shown in Fig. 4. These blocks should be set in place when the blocks D are inserted, and they should be tacked to the outer strips of the member C, and the inner strips of the member B should also be tacked to them, to assist in holding said strips in place, until the outer strips of the member B are applied. The cleats F should also be spiked to the blocks G when they are used.

The next thing will be to either remove the stakes, or the blocks fastened to the floor, or to disconnect the member C from said stakes or blocks. The structure will then be ready to be erected and be placed on the frame of the building as shown in Fig. 2. Usually it is not necessary to have all the roof structures of this double laminated type, and when extra strength is not needed, a certain number of single structures H may be used, as shown in Fig. 2. Fig. 2 also shows the plates I, one of the posts J, studdings K and the floor joists L of the frame of a building, as well as a couple of the roof boards M. Usually only two laminated members B and C are needed but where extra strength is required an extra member may be added in which case additional bracing means will be used in the additional spaces.

A roof structure formed in this way will be self supporting, requiring no additional braces or trussing, and it will be exceedingly strong. Within necessary limits, the wider the spaces, where the central bolted blocks D are placed the stronger it will be. When set in position on the frame of the building the lower ends of the structure will be approximately perpendicularly disposed, and they will cause little or no outward lateral strain on the building, such as all truss constructions have to a greater or less extent. The central side spacing between the ends and the central portions of the laminated members B and C, and the bracing blocks D and G inserted therein with the bracing cleats F spiked thereon, insure the great self contained strength of my roof structure.

To form a ridge on the center of the roof, a pair of planks N shown in Fig. 1 may be spiked to the central part B of the roof structure, and be supported in place by members O, one of which members is preferably spiked to a side of the part A′ and its upper end is butted against the under edges of the planks N, and the other member is set on the upper side of the part A′ and is spiked to one side of the planks N, as shown in Fig. 5. The members O should also be spiked together. Also projections P may be placed on the sides of the structures to form supports for the eaves, as shown in Fig. 1. When the structures are all in place on the frame of the building they and their attachments may be covered with roofing material applied in the usual manner.

If desired, small braces R may be connected to the lower portions of the roof structures and to the floor joists, as shown in Fig. 1, or to other portions of the building frame, to strengthen the connections of the roof structure with the frame of the building. Also small cleats S may be applied to the lower ends of the structure, where the members B and C are closely joined together, to further strengthen the structure. Fig. 1 also shows a couple of central beams T with portions of posts U below them to support the floor joist L when this is necessary. The drawings do not show any of the lower portion of the building frame.

My roof structure being composed of continuous laminated members extending from one side of the roof to the other, requires no ridge pole member, which is generally used in all roof structures except those which are exceedingly flat and which require either central supports or tension rods to prevent the spreading of the side walls of the building upon which the roof structure is mounted. My invention does away with all of these things which are more or less objectionable, and being continuous with its lower ends and its upper central portions closely connected together for some lengths, while the intermediate side portions between the lower ends and the upper central portions are spaced apart and thoroughly braced, it forms the very strongest kind of a self supporting roof structure.

In Fig. 2 the strips forming the laminated members B and C are not shown, because to show them plainly the drawing would have to be made larger than permitted by Patent Office requirements. About the only thing Fig. 2 is intended to show is how my improved roof structures are set on the frame of the building. It is preferable that the single intermediate structures H, shown in Fig. 2, should also be of laminated construction, but if desired they may be made in any suitable manner. The double laminated structures consisting of the members B and C, with the bracing means added thereto, as described, constituting my invention, are exceedingly simple in construction, and besides possessing great strength are easily and cheaply made, are easily hoisted into and held in position, and they also furnish the largest possible amount of free space immediately under the roof.

What I claim as new and desire to secure by Letters Patent is—

1. In roof structures, the combination of two laminated members, one being placed inside of the other, and both being curved continuously from one side of the roof to the other in an approximately semi-elliptical formation, the ends and the central portions of the members being placed closely against each other for some distance and securely fas-

tened together, while the side portions of the members between their ends and central portions are gradually spaced apart, the spaces being the widest in the middle portions of the sides between their ends and their centers.

2. In roof structures, the combination of two laminated members, one being placed inside of the other, and both being curved continuously from one side of the roof to the other in an approximately semi-elliptical formation, the ends and the central portions of the members being placed closely against each other for some distance and securely fastened together, while the side portions of the members between their ends and central portions are gradually spaced apart, the spaces being the widest in the middle portions of the sides between their ends and their centers and a series of bracing members inserted in said spaces and securely fastened to the adjacent portions of the members.

3. In roof structures, the combination of two laminated members, one being placed inside of the other, and both being curved continuously from one side of the roof to the other in an approximately semi-elliptical formation, the ends and the central portions of the members being placed closely against each other for some distance and securely fastened together, while the side portions of the members between their ends and central portions are gradually spaced apart, the spaces being the widest in the middle portions of the sides between their ends and their centers, and a series of cleats spiked on the sides of the spaced apart portions of the members.

4. In roof structures, the combination of two laminated members, one being placed inside of the other, and both being curved continuously from one side of the roof to the other in an approximately semi-elliptical formation, the ends and the central portions of the members being placed closely against each other for some distance and securely fastened together, while the side portions of the members between their ends and central portions are gradually spaced apart, the spaces being the widest in the middle portions of the sides between their ends and their centers, the portions of said ends which are fastened together on the opposite sides of the roof being practically parallel with each other, and when placed on the frame of a building will be held in a substantially vertical position.

5. In roof structures, the combination of two laminated members, one being placed inside of the other, and both being curved continuously from one side of the roof to the other in an approximately semi-elliptical formation, the ends and the central portions of the members being placed closely against each other for some distance and securely fastened together, while the side portions of the members between their ends and central portions are gradually spaced apart, the spaces being the widest in the middle portions of the sides between their ends and their centers, attachments forming a peak, secured to the upper central portions of said members.

6. In roof structures, the combination of two laminated members, one being placed inside of the other, and both being curved continuously from one side of the roof to the other in an approximately semi-elliptical formation, the ends and the central portions of the members being placed closely against each other for some distance, and securely fastened together, while the side portions of the members between their ends and central portions are gradually spaced apart, the spaces being the widest in the middle portions of the sides between their ends and their centers, attachments forming eave supports secured to the portions of said ends immediately above their ends where they are fastened together.

ALBERT C. JOHNSON.