April 8, 1930. W. KLINGENBERG 1,753,892

SPACE COVERING STRUCTURE, SUCH AS ROOFS, WALLS, AND THE LIKE

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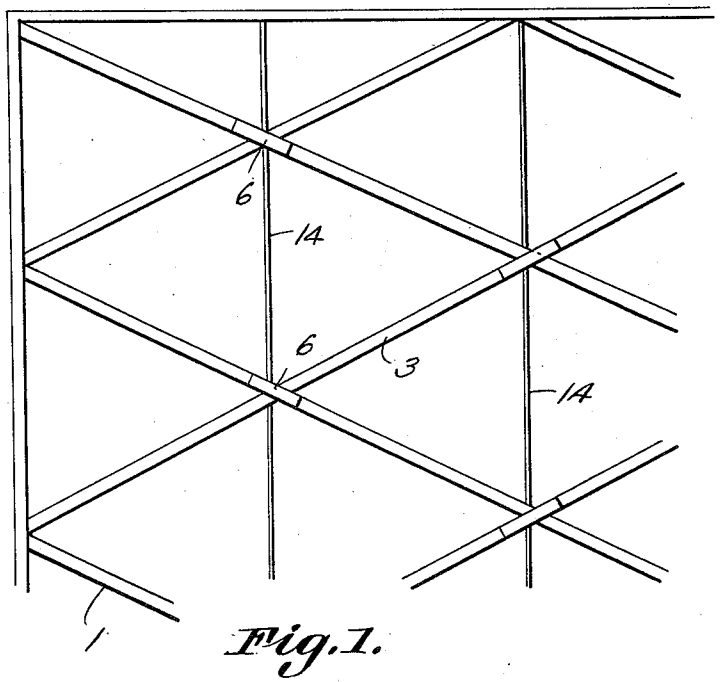


Fig. 1.

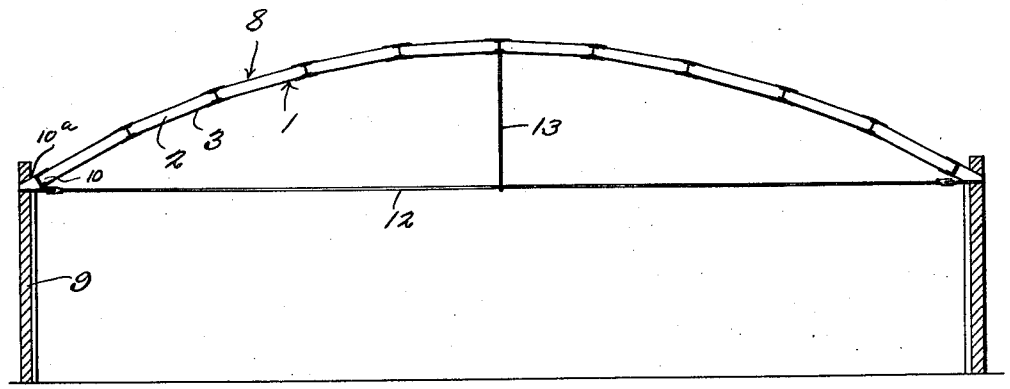


Fig. 2.

Inventor

Wilhelm Klingenberg

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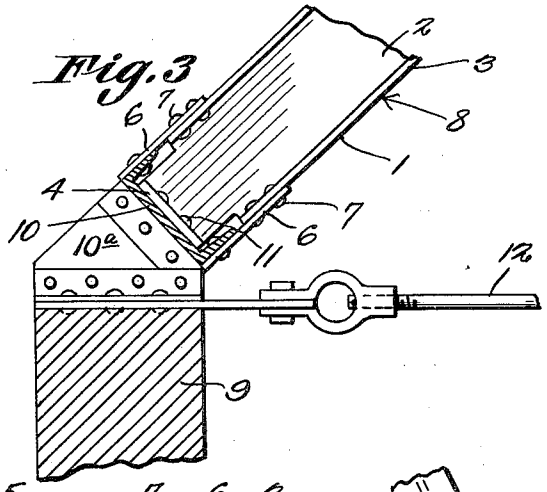
Attorney

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Fig. 3.



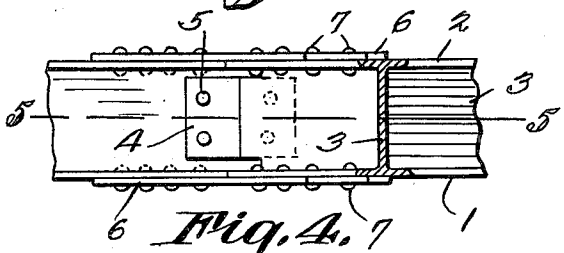


Fig. 4.

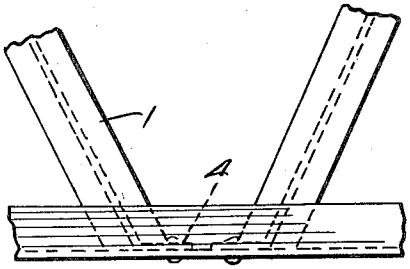
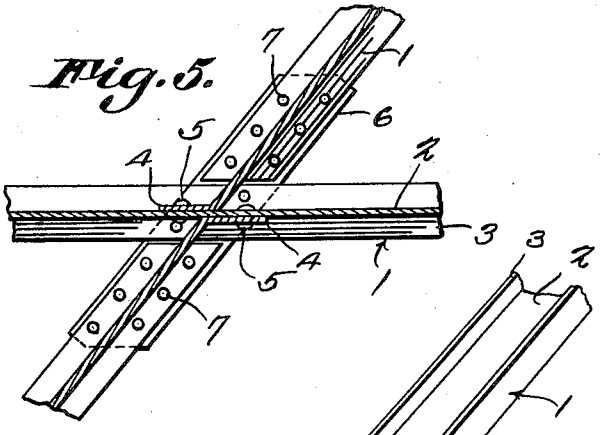


Fig. 6.

Fig. 5.



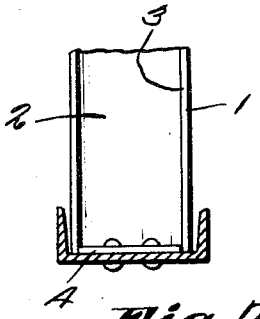


Fig. 7.

Fig. 8.

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Patented Apr. 8, 1930 1,753,892

UNITED STATES PATENT OFFICE

WILHELM KLINGENBERG, OF NEW YORK, N. Y., ASSIGNOR TO LAMELLA ROOF SYNDICATE, INC., OF NEW YORK, N. Y.

SPACE-COVERING STRUCTURE, SUCH AS ROOFS, WALLS, AND THE LIKE

Application filed April 8, 1927. Serial No. 182,132.

This invention relates to improvements in space covering structures such as roofs, walls and the like, comprising recticularly connected lamella units by means of which the walls and roofs of buildings may be constructed and readily erected in a very short space of time and which buildings, and especially the roofs thereof require considerably less material than others, can be erected in a short space of time without the employment of cranes, but only light scaffolding, consist of standardized units, manufactured at the mills and shipped ready for erection; provide a safe roof in which even if some of the lamella units are destroyed the stresses are taken up automatically by the adjoining lamellas and the destroyed pieces can be repaired or replaced like a hole in a fishing net; which can readily be dismantled and shipped; allows a maximum utilization of space; admits good distribution of light; and enables a building even of large size, to be constructed without the employment of girders, columns or other like pieces, and which enables the roof to be constructed of beautiful architectural appearance either of Gothic or of segmental arch form.

This invention is an improvement on the space covering structure described in Letters Patent of the United States, No. 1,483,037 granted to Friedrich Zollinger, February 5, 1924.

One object of the present invention is to effect improvements in the construction of the lamellas by constructing the same of steel or structural iron.

Another object is to effect improvements in the construction of the lamella units by forming each with a web and a flange at an angle thereto so that the webs of the lamellas may be secured together at the points of intersection of the lamellas.

Another object is to effect improvements in the construction of the lamellas, each with a web and a flange at an angle thereto and in the means for forming a structure comprising reticularly connected separate lamellas, by securing the adjacent ends of two of the lamellas with their webs extended beyond their flanges and bent at the extended portion angularly with respect to the axes of the said lamellas, and securing said bent portions of the webs of the said two lamellas to the web of the intersecting lamella.

A further object is to effect improvements in the structure by providing a plate which is secured on the flanges of the two lamellas which have their bent extended ends secured to opposite sides of the web of the intersecting lamella and also extends across the said intersecting lamella and is secured to the flange thereof.

Another object is to provide improved means for securing the reticularly connected separate lamellas to a frame member.

Another object is to provide a tie which connects certain of the lamellas at their points of intersection and is arranged to resist thrust.

With the above and other objects in view, the invention consists in the construction, combination and arrangement of devices hereinafter described and claimed.

In the accompanying drawings,

Figure 1 is an elevation of a portion of a structure constructed in accordance with my invention showing an assembly of lamellas forming several members thereof and which may be a portion of either a wall or a roof.

Figure 2 is a diagrammatic elevation, partly in section, of a portion of a building constructed in accordance with my invention and including walls and a roof.

Figure 3 is a detail elevation on a larger scale, and partly in section, of an assembly of lamellas, a wall, a plate member, an angular member and an anti-spreading tie.

Figure 4 is a detail elevation, partly in section, of a joint formed by several lamellas and their plates.

Figure 5 is a detail sectional view of the same taken on the plane indicated by the line 5—5 of Figure 4.

Figure 6 is a detail elevation of a channel iron plate member and lamellas secured thereto.

Figure 7 is a detail transverse sectional view of the same.

Figure 8 is a detail perspective of one end portion of one of the lamellas.

The lamellas or units 1 are each, in accordance with my invention, of angle iron or steel of suitable dimensions so that each lamella has at least a web 2 and a flange 3. Each lamella may be either exactly straight, as when designed for use in a wall structure, or either straight or slightly curved, when designed for use in a roof structure. Preferably, and as here shown, each lamella is of I form provided with oppositely extended flanges 3 at opposite sides in addition to the web 2. In practice, the lamellas are standardized, of a suitable length, and are constructed at a mill or foundry and completed ready to be assembled and transported to the site where a building is to be erected. Each lamella is provided at each end with an extended web portion 4 which projects beyond the flanges 3 and is bent at a suitable angle.

In assembling the lamellas to form a wall or roof structure of net like appearance, two of the lamellas will be arranged end to end and either exactly or approximately in alignment with each other and are arranged with their extended bent web ends 4 on opposite sides of the web of the intersecting lamella and said extended bent web ends are riveted to the web of the intersecting lamella as shown in Figures 4 and 5, the rivets being indicated at 5. It will be understood from the foregoing that each joint is formed at a point corresponding with the adjoining ends of two substantially aligned lamellas and at a point intermediate the ends of the intersecting lamella.

To strengthen each joint I provide one or more plates 6. Each of said plates is arranged on the outer side of the flanges 3 of the two substantially aligned lamellas and extends across and bears against the corresponding flange of the intersecting lamella, said plate being secured to the flanges of all three of the lamellas by rivets 7. The rivets 5 and 7 employed in my structures are such rivets as are commonly employed in the iron or steel frame work of buildings and other structures. Bolts may be also employed.

Where a roof 8 bears on a wall 9, I employ a frame plate member 10 which is preferably a channel iron and the web of which bears on an angle member 10^a on the upper edge of the wall, the adjoining lamellas having their bent and extended web portions 4 secured to the web of said channel iron frame member 10 by rivets 11.

Suitable ties 12 may be employed to connect the frame members 10 on opposite side walls, to prevent the roof structure from spreading. Intermediate portions of the ties may be connected to the roof by suspension rods 13. To strengthen the roof structure and resist thrust, I also provide tie rods 14 each of which connects certain of the lamellas at their points of intersection, said tie rods extending across the centers of certain of the meshes in the roof or wall structure.

A roof or wall structure composed of my improved lamellas is comparatively light, is strong, durable, and cheap, and may be readily erected in a short space of time and by workmen of only ordinary skill.

A building of any desired size may thus be constructed and a building of even large size, for use as a barn, factory, mill, foundry, or as an exhibit or exposition building, may be erected by the employment of my improved lamellas and in accordance with my invention, entirely without trusses and without columns or beams, so as to provide absolutely unobstructed space between the walls and under the roof.

The walls and roof structures may be covered on the outer side and also on the inner side if desired with any suitable material and within the scope of my invention. Where extraordinarily strong building is desired, the meshes of the wall or roof structure may be filled with concrete or other suitable material.

While I have herein shown and described a preferred form of my invention, I would have it understood that changes in the form, proportions and construction of the several parts may be made without departing from the spirit of my invention, within the scope of the appended claim.

What I claim is:

A space covering and closing structure consisting solely of obliquely arranged separate lamellas each having a web and a flange at an angle thereto, each pair of the lamellas being arranged in axial alignment and their adjacent ends having their webs extended beyond their flanges at the ends, and bent at the extended portions angularly with respect to the axes of said lamellas, said bent portions of the webs of the said pair of lamellas bearing directly against and being secured to opposite sides of the web of the intersecting lamella at a point intermediate the ends of said intersecting lamella, the flanges of the lamellas being in the same plane so that the ends of the flanges of each pair of lamellas are in close proximity to and parallel with the opposite sides of the flange of the intersecting lamella.

In witness whereof I affix my signature.

WILHELM KLINGENBERG.