Sept. 22, 1931. W. KLINGENBERG 1,823,945

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

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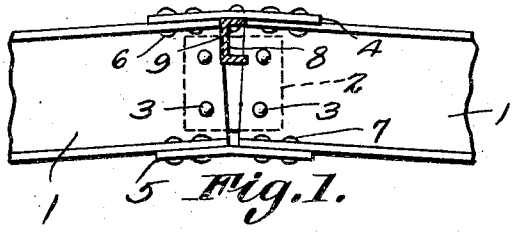


Fig. 1.

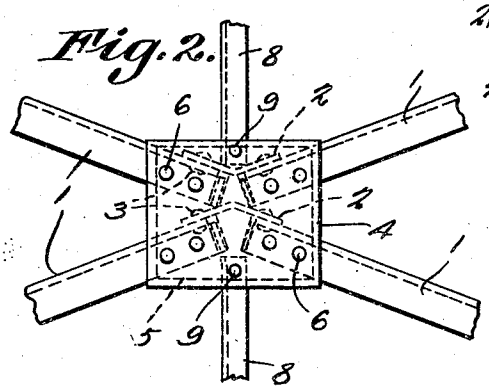


Fig. 2.

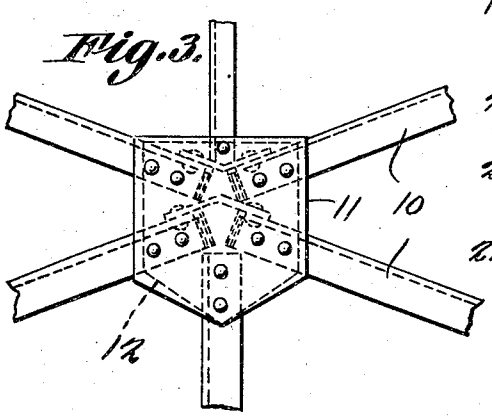


Fig. 3.

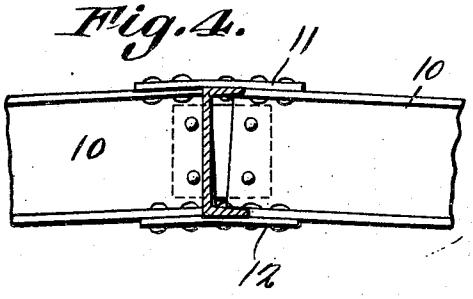


Fig. 4.

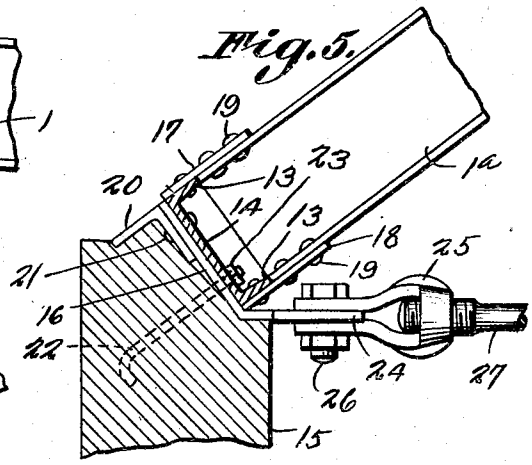


Fig. 5.

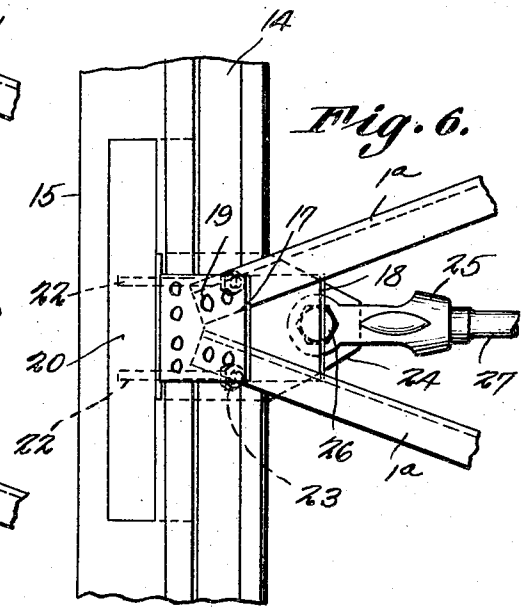


Fig. 6.

Inventor

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

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Fig. 7.

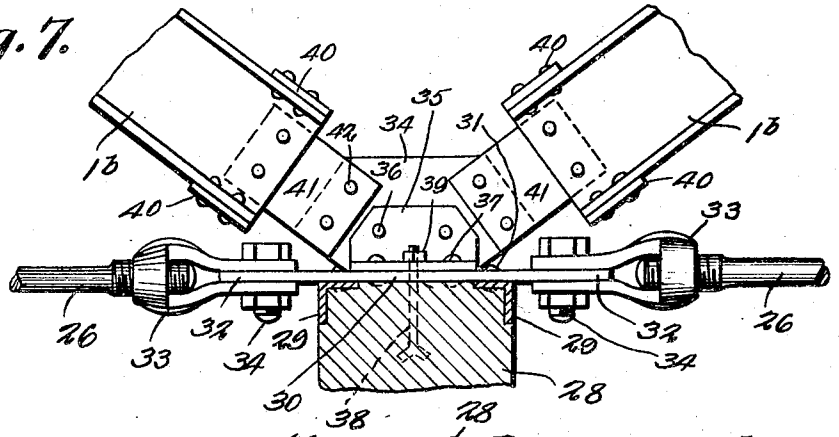


Fig. 8.

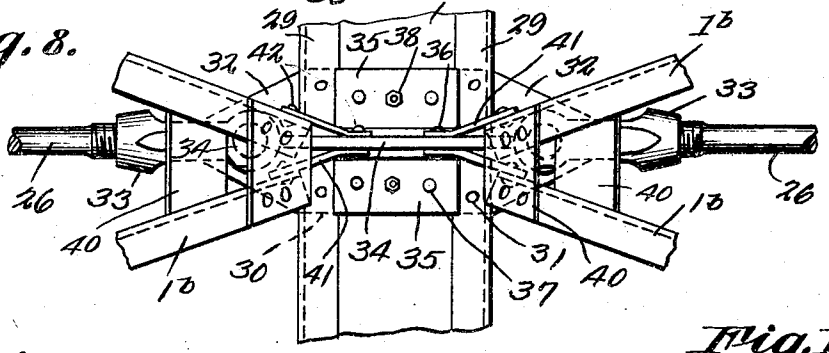


Fig. 11.

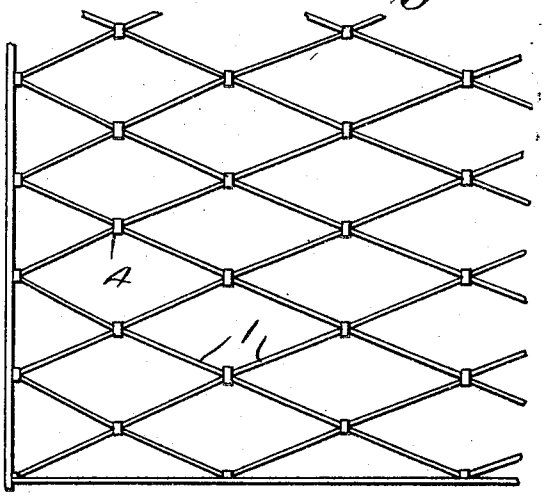
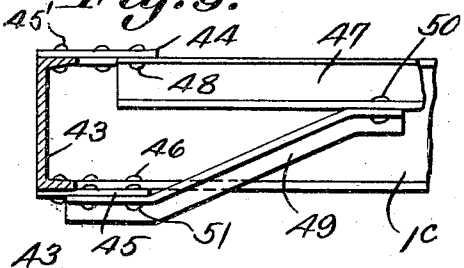


Fig. 9.



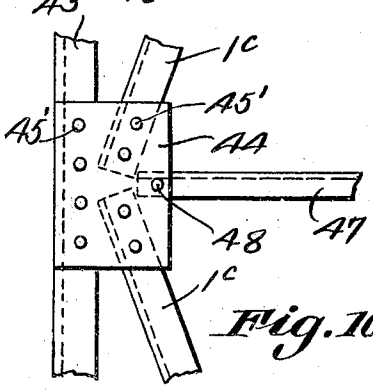


Fig. 10.

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Patented Sept. 22, 1931 1,823,945

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 August 2, 1927. Serial No. 210,171.

This invention relates to improvements in space covering structures, such as roofs, walls and the like, composed principally of lamellas such as described in Letters Patent of the United States No. 1,483,037 granted to Friedrich Zollinger February 5, 1924 and in my copending application for Letters Patent of the United States, Serial No. 182,132, filed April 8, 1927, one object of the present invention being to combine lamellas and purlins with means for connecting the ends of lamellas together and for also connecting the purlins to the joints between the lamella ends so that the purlins in a roof structure also operate as ties for the roof lamellas.

Another object is to provide improved means for securing the ends of the arches composed of lamellas to the side walls of the structure and also to the transversely arranged tie rods.

Another object is to effect improvements in the construction of the connections of the arches at the center sill.

Another object is to effect improvements in the construction of the end arches.

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

In the accompanying drawings

Figure 1 is an elevation partly in section of a joint between the meeting ends of lamellas and purlins in accordance with my present improvements.

Figure 2 is a plan of the same.

Figure 3 is a plan of a modified construction of such joint.

Figure 4 is an elevation of the same partly in section.

Figure 5 is an elevation partly in section showing the means for connecting lamella arch ends to tie rods and also for a side wall.

Figure 6 is a plan of the same.

Figure 7 is a view similar to Figure 5 and showing the connection between lamella arch ends at a center sill.

Figure 8 is a plan of the same.

Figure 9 is a detail elevation of a modified connection at an end arch.

Figure 10 is a plan of the same.

Figure 11 is a diagrammatic plan of one corner of a roof as constructed of lamellas in accordance with my present improvements.

Referring especially to Figures 1 and 2, the converging ends of lamellas 1 are connected together in pairs by angularly bent iron or steel plates 2 which are secured to the webs of the lamellas by rivets 3. The lamellas are straight and are arranged in the required angular relation, vertically, and the pairs of the lamellas are connected together at their meeting ends by cover plates 4 and base plates 5 which are similar in construction and which bear respectively on the upper side of the upper flanges of the lamellas and on the lower sides of the lower flanges thereof and are respectively secured to said flanges by rivets 6, 7. The plates 2 and the plates 4, 5 cooperate to secure the lamellas in the required reticular relation to form the roof or other structure and when the structure is a roof purlins 8 which are channel irons of appropriate dimensions have their ends arranged at the joints between the lamellas and their upper flanges secured to the under side of the plates 4 by rivets 9. These purlins not only function as such in the construction of the roof arch but also operate as ties.

In the modification shown in Figures 3 and 4 the purlin members are alternated with lamellas 10 which are identical in construction with the lamellas 1 and hence coextensive vertically therewith, and are secured directly to and between both the upper plates 11 and base plates 12 and function both as purlins and as ties, as will be understood.

Referring especially to Figures 5 and 6, the lamella arch ends 1^a are arranged to butt against the edges of flanges 13 of a channel beam 14 which extends along the upper side of a wall 15 which may be of masonry, or of concrete or of other suitable construction, the said beam 14 being laterally inclined according to the inclination of the contiguous lamellas 1^a. On the outer side of said beam and between it and the wall at spaced intervals, corresponding to the lamella arch ends,

are bearing plates 16 which are secured to the upper and lower sides of the lamella arch ends by plates 17, 18 which are riveted thereto as at 19. Associated with each bearing plate, at the upper portion thereof, is an angularly bent saddle plate 20 which bears directly on the top of the wall 15 and is secured to the bearing plate and to the web of the channel beam 14 by rivets 21, and anchor rods 22 are also employed which are embedded in the wall 15 and extend through openings in the bearing plates and in the channel beam and are provided at the upper, threaded ends, with nuts 23 which bear on the upper or inner sides of the web of the channel beams.

Each bearing plate 16 is provided at the inner side of the wall with a horizontally arranged extension or arm 24 to which a clevis 25 is secured by a bolt 26, one of the transverse tie rods 27 having its outer ends, which is preferably of enlarged diameter, threaded in the clevis as shown.

Referring especially to Figures 7 and 8, the center or intermediate wall 28 which may be of masonry, concrete or other suitable construction is provided on its upper edge with longitudinally extending angle plates 29. Bearing plates 30 for the inner lamella arch ends 1^b are arranged transversely on said wall, secured to said angle plates 29 by rivets 31 and are provided with end extensions 32 to which clevises 33 are secured by bolts 34, the inner ends of the tie rods 26 being threaded in said clevises. Vertical flange plates 34^a are provided, one for each bearing plate 30 and arranged on the center thereof and longitudinally with respect thereto, and each flange plate is secured to its bearing plate by a pair of angular plates 34^a, said flange plate being arranged between and riveted to the vertical webs of said angular plates as at 36 and the horizontal webs of said angular plates being riveted to said bearing plate as at 37. Anchor bolts 38 are embedded in the wall 28, the upper ends extend through openings in bearing plates 30 and the horizontal webs of the angle plates 35 and are provided with nuts 39 which are threaded thereon. The lamella arch ends 1^b are provided on their upper and lower sides with plates 40 which are riveted thereto on their upper and lower flanges and the webs of said lamella arch ends are riveted to plates 41, said plates 41 being riveted together and also to the flange plates, as at 42, said plates 41 being arranged on opposite sides of the flange plates.

Such construction as herein described and as shown in Figures 5 to 8 inclusive are exceedingly strong and securely connect the arch ends to the walls and also to the transverse tie rods and moreover admit of the adjustment and readjustment of the tie rods and their clevises, as will be understood.

Referring especially to the modified construction of end arch shown in Figures 9 and 10, the lamella arch ends 1^c are connected to the channel beam 43 by upper and base plates 44, 45 which are riveted to the flanges of said beam and lamella arch ends as at 45, 46. Channel tie members 47 have their upper flanges riveted as at 48 to the under side of the top plates 44 and brace angular members 49 have their inner ends riveted to the lower flanges of said tie members as at 50 and their outer ends riveted to the lower sides of the base plates as at 51. Thereby not only are the lamella end arch members securely connected to the channel beams and effectively braced and the tie roof construction greatly strengthened, but the ties by the latter are also securely braced and the strength of the structure and end arch connections is greatly increased.

While I have herein shown and described preferred forms of my invention, I would have it understood that other modifications may be made in the form, proportion and construction of the several parts within the scope of the appended claims.

Having thus described my invention, what I claim is:

1. In a space covering and closing structure comprising reticularly connected separate lamellas, a channel beam, a plurality of lamellas arranged with their ends close together and opposed to the channel side of said beam, plates secured to and connecting said lamella ends to said beam, and a bearing plate on the side of said beam opposite the ends of said lamellas and secured to said side of said beam.

2. In a space covering and closing structure comprising reticularly connected separate lamellas, a channel beam, a plurality of lamellas arranged with their ends close together and opposed to one side of said beam, plates secured to and connecting said lamella ends to said beam, a bearing plate on the opposite side of and secured to said beam, said bearing plate having an arm extending inwardly from the inner side thereof under the lamellas and a tie rod connected to said arm of said bearing plate.

3. In a space covering and closing structure comprising reticularly connected separate lamellas, a channel beam, a plurality of lamellas arranged with their ends close together and opposed to the channel side of said beam, plates secured to and connecting said lamella ends to said beam, and a bearing plate on the opposite side of and secured to said beam and a saddle plate secured to the lower side of said bearing plate.

4. In a space covering and closing structure comprising reticularly connected sepa-

rate lamellas, a channel beam, a plurality of lamellas arranged with their ends close together and opposed to the channel side of said beam, securing means connecting said lamella ends to said beam, a bearing plate on the opposite side of and secured to said beam and an anchor member secured to said bearing plate and to said beam.

5. In a space covering and closing structure comprising reticularly connected separate lamellas, a channel beam, a plurality of lamellas arranged with their ends close together and opposed to one side of said beam, securing means connecting said lamella ends to said beam, a bearing plate on the opposite side of and secured to said beam, said bearing plate having an arm extending inwardly from the inner side thereof under the lamellas, a clevis attached to said arm of said bearing plate and a tie rod connected to said clevis.

In witness whereof I affix my signature.

WILHELM KLINGENBERG.