

No. 653,017.

Patented July 3, 1900.

G. BRUCK.  
ROOF.

(Application filed Jan. 17, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

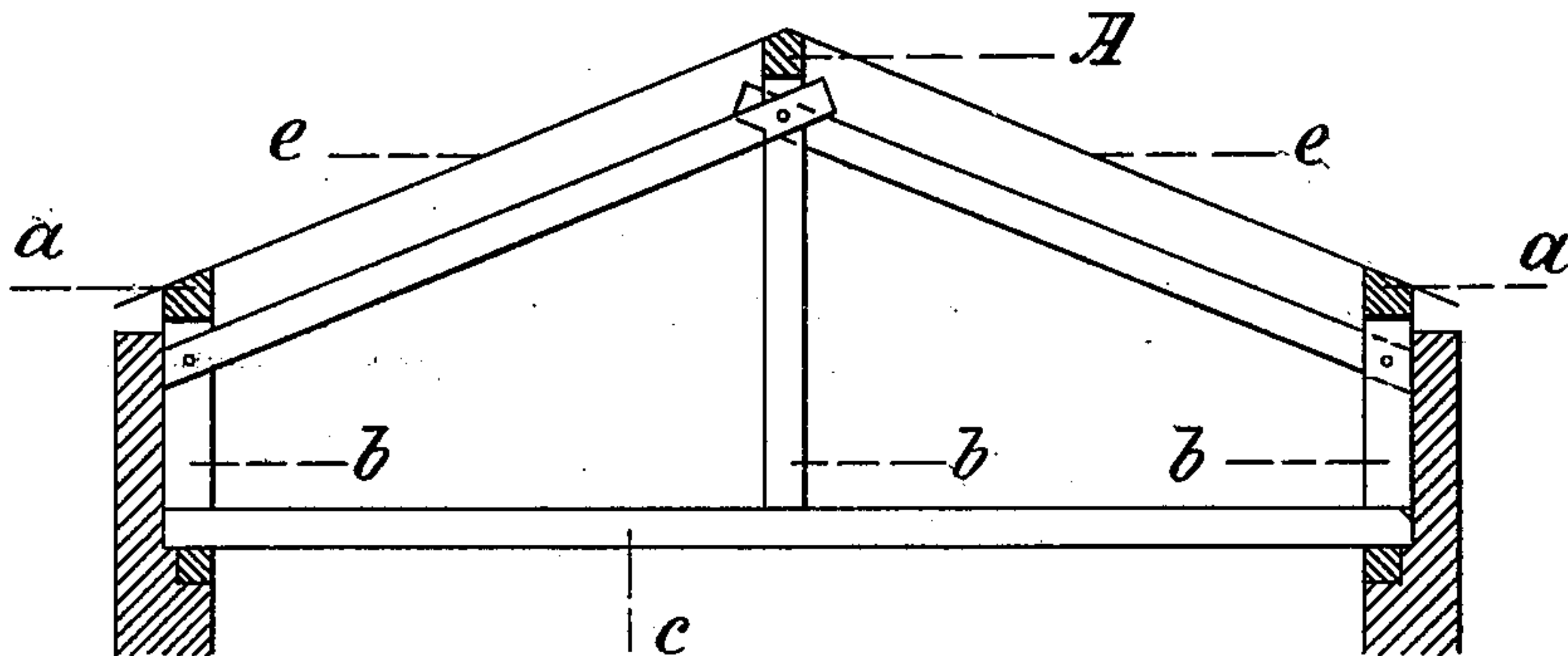


Fig. 2.

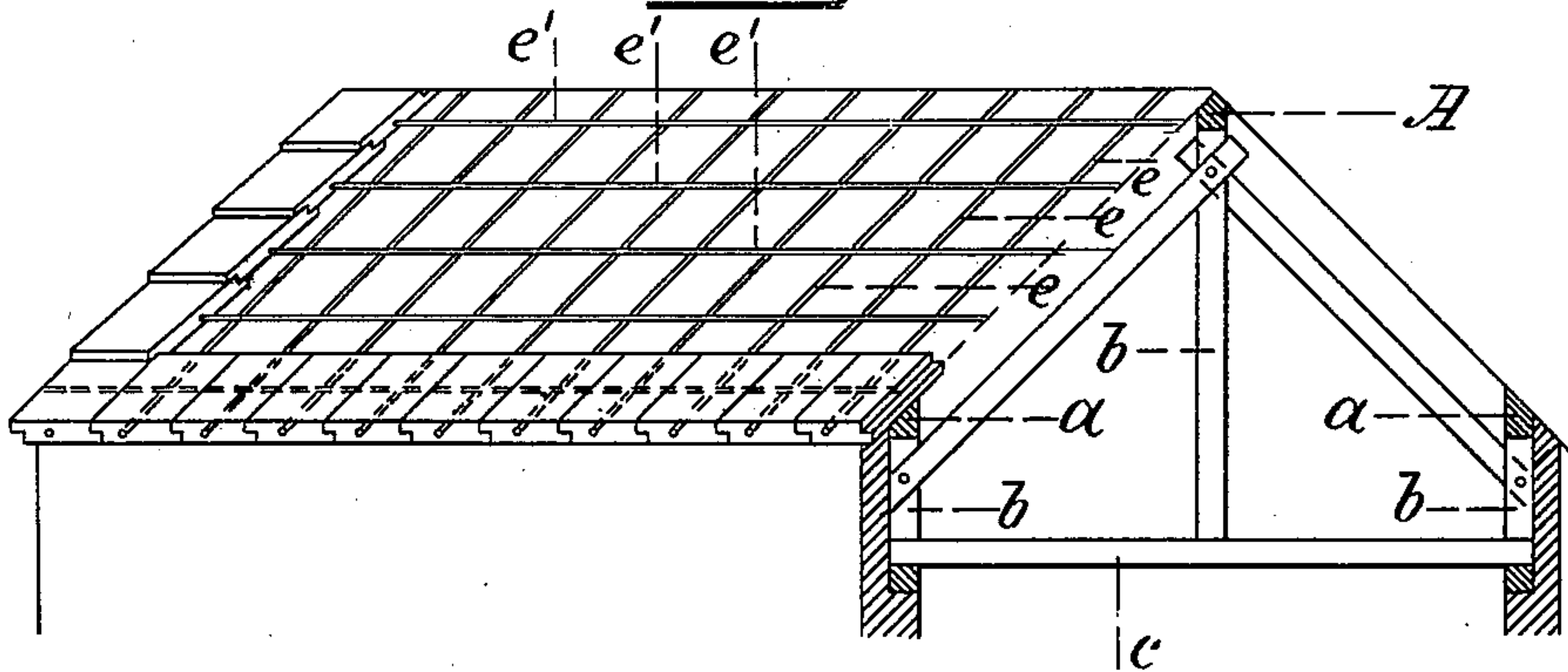


Fig. 3.

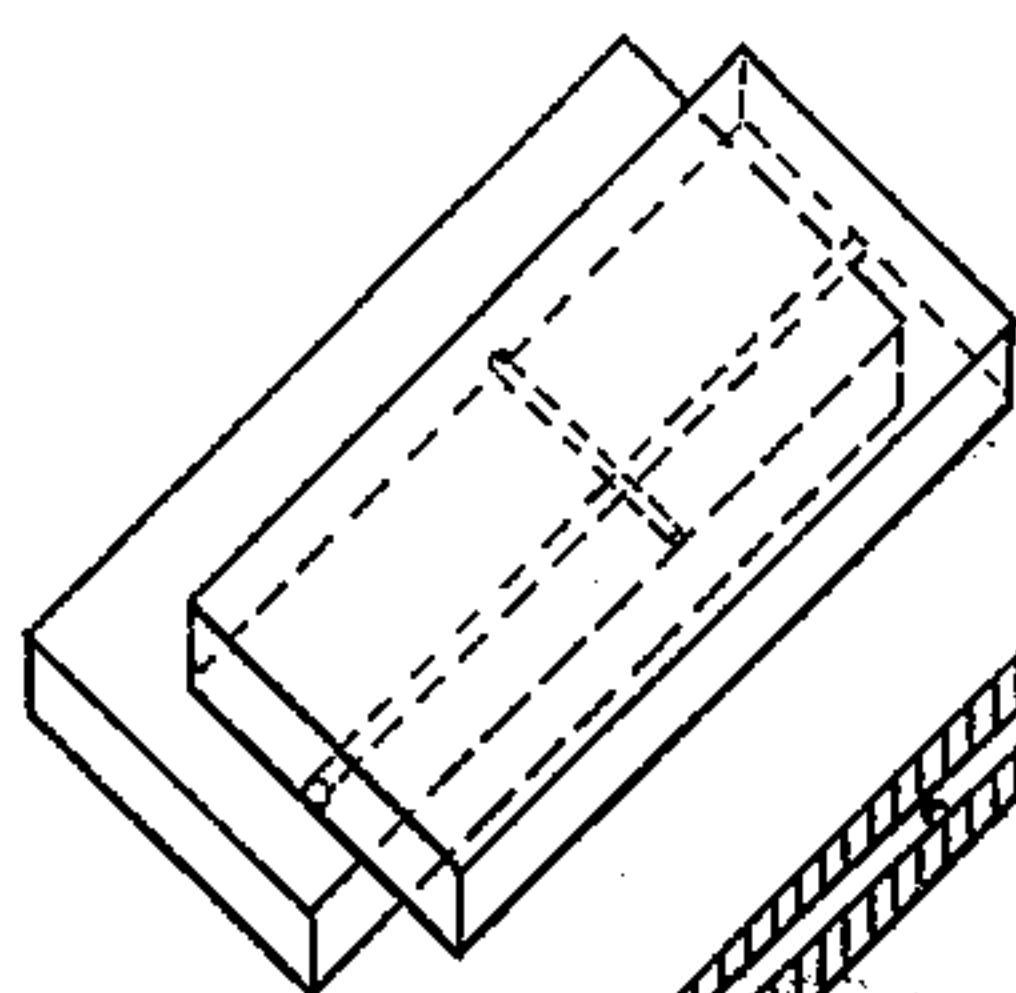
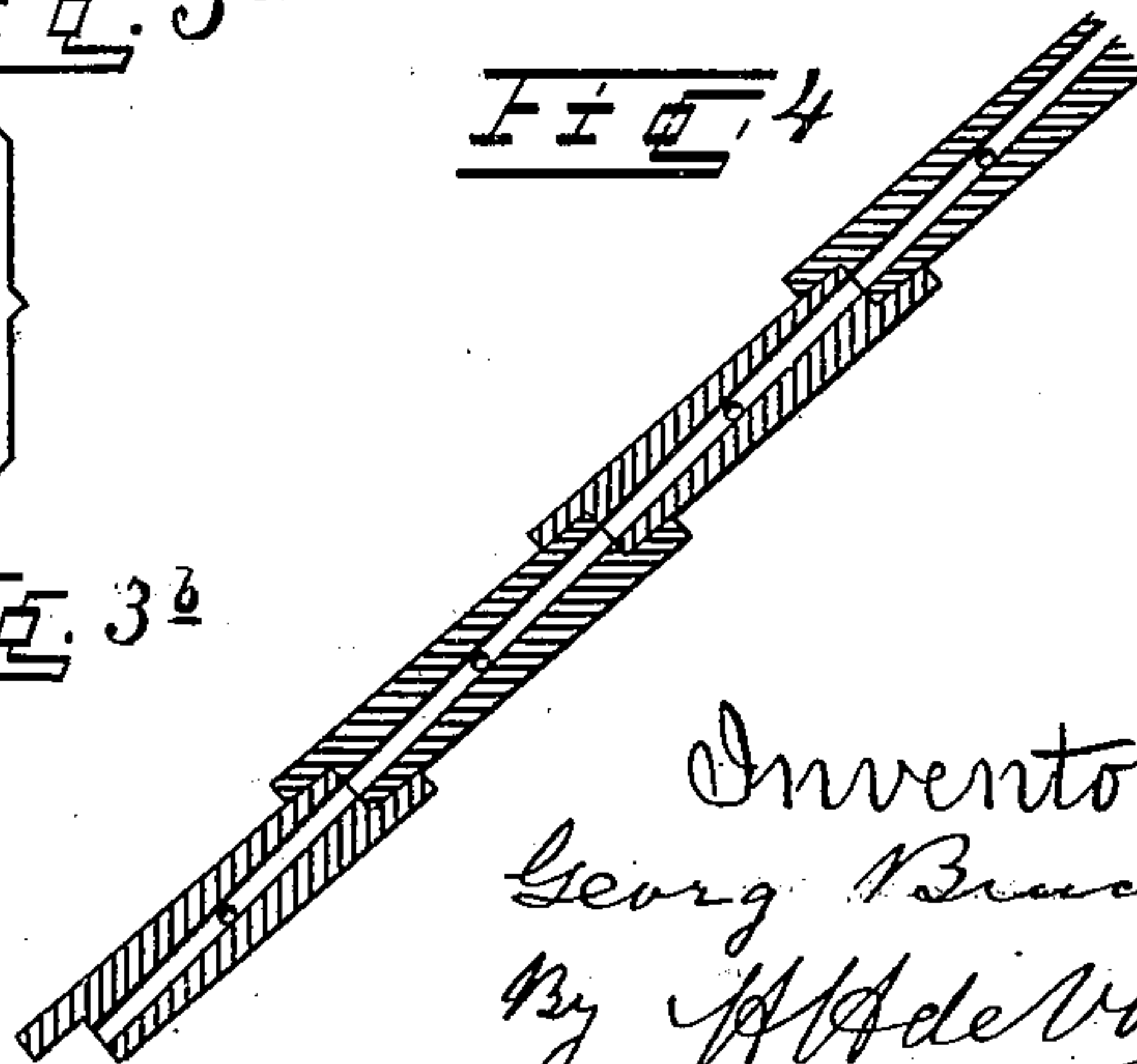


Fig. 3<sup>a</sup>

Fig. 3<sup>b</sup>

Fig. 4.



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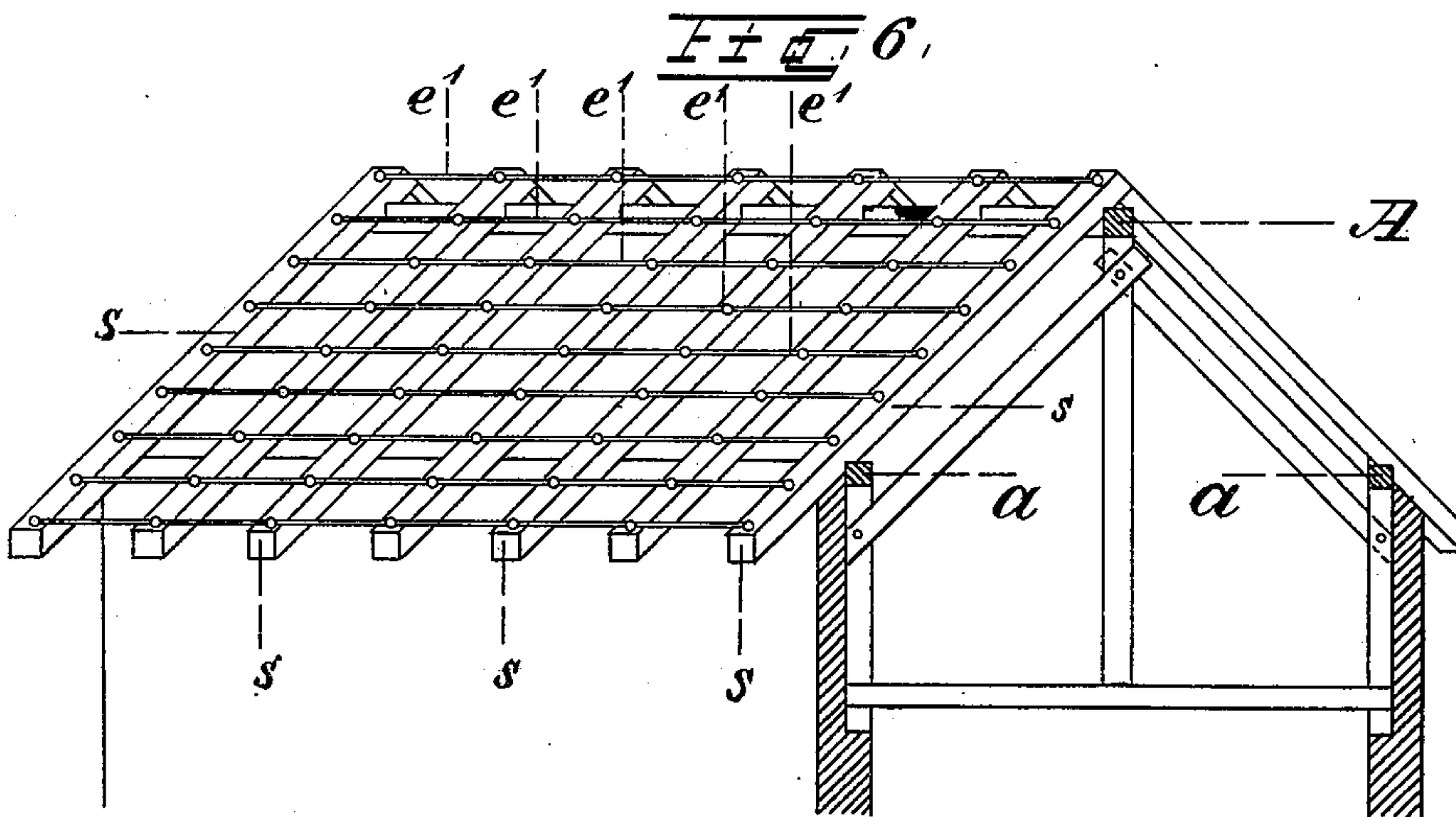
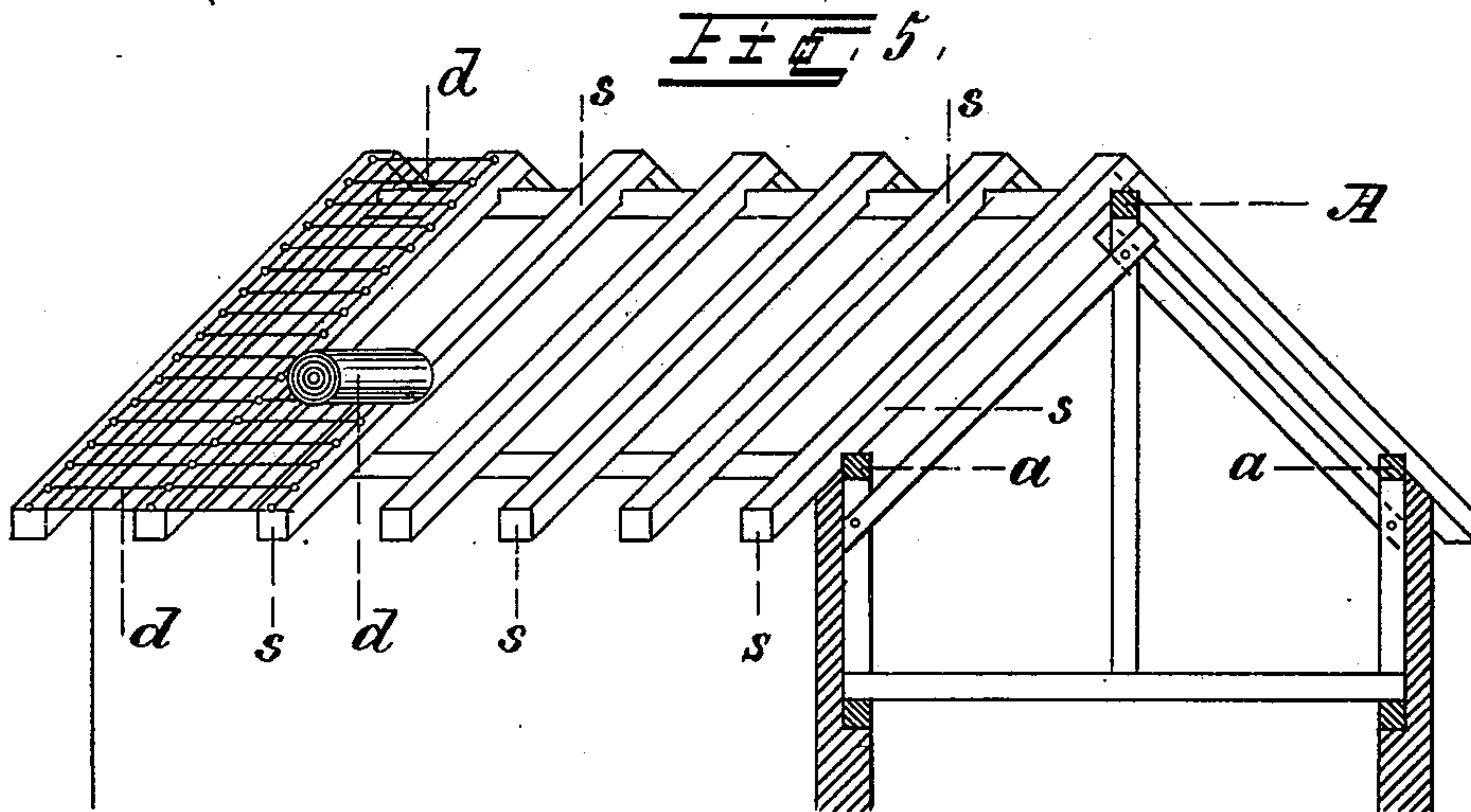
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2 Sheets—Sheet 2.



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# UNITED STATES PATENT OFFICE.

GEORG BRUCK, OF BERLIN, GERMANY.

## ROOF.

SPECIFICATION forming part of Letters Patent No. 653,017, dated July 3, 1900.

Application filed January 17, 1900. Serial No. 1,743. (No model.)

*To all whom it may concern:*

Be it known that I, GEORG BRUCK, merchant, a subject of the German Emperor, at present residing at 43 Michaelkirchstrasse, in the city of Berlin, Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Roofs, of which the following is a specification.

This invention has reference to a new and improved method of construction of roofs by means of which it is possible to use a wire-netting as the base for attaching the tiles or other covering material to the surface of the roof, the rafters and the roof-laths, or either of them, being replaced by wires being stretched across the roof, which, if desired, may be held in position by suitable braces. It is obvious that by this method a construction will be obtained which will be fireproof to a very high degree and offer great resistance to the action of atmospheric influences.

My invention is illustrated in the accompanying drawings, showing by way of example various ways of application of my invention to a roof of ordinary construction.

Figures 1 and 2 are respectively a front view and a perspective view of a preferred form of construction, wires being substituted both for the rafters and the laths of the roof. In the construction shown in Figs. 3 and 4 the wires are placed at the inside of the hollow tiles. Fig. 3 is a perspective view of one of the tiles, and Figs. 3<sup>a</sup> and 3<sup>b</sup> are respectively cross-section end and side views of the same. Fig. 4 is a cross-section side view of a number of the tiles as placed in position on the roof. Fig. 5 is a perspective view of the combination of ordinary rafters with wire-netting for the support of the tiles. Fig. 6 shows a perspective view of the combination of ordinary rafters with a series of wires stretched across the roof in place of the laths heretofore in use.

Referring particularly to Figs. 1 and 2, which represent an ordinary purlin-roof, A *a* are the purlins, which are supported by the three props *b*, which are suitably braced against the tie-beam *c*. Wires *e* are stretched from the ridge-purlin A to the purlins *a*, fixed at the walls of the building. In case of the span of the roof being exceedingly large these wires may be supported by suitable girders

and the like, so as to prevent any bending or deformation of the wires. The said wires are used in place of the rafters, upon which the tiles are fastened either by means of laths or by horizontal wires *e'*, which are secured in position either by uniting them with the other system of wires *e* or in any other suitable manner. A very light roof of easy construction and of great supporting power will be thus obtained, which may be rendered entirely fireproof by using iron rails or bars for the tie-beam *c*, the props *b*, and the purlins A *a* *a*. It is obvious that this construction and arrangement of wires may also be used for any other kind of roof, the construction of the roof being greatly simplified thereby and rendered more durable and of greater resistance. The wires may either penetrate through suitable openings in the tiles or they may be arranged above or below the latter.

In the case of laths being used in connection with the wires they are placed directly upon the wires and attached thereto in any suitable manner. The laths may be replaced by horizontal wires *e'*, placed across the wires *e*, to which they have to be tied directly or indirectly at the points of crossing. In this case the tiles, as with the use of laths, are suspended upon the horizontal wires *e'* by means of projections upon the face of the tiles, or the tiles may be provided with pins, wire ends, or bands, securely attached thereto, by means of which they are tied to the cross-wires *e'*.

In the construction shown in Figs. 3 and 4 I have shown the application of my invention to a roof covered with artificial-stone plates provided with interior channels which may be arranged either in the same or in different planes and which pass through the plates either in a longitudinal or in a transverse direction. If the channels are arranged in the same plane, they must be sufficiently wide to allow of the wires crossing each other within the plate, as shown in Fig. 3 of the drawings. These plates are arranged in series from the eaves to the ridge of the roof, the wire *e* or pieces of wires being drawn through the longitudinal channels and fastened to the ridge-purlin A by any appropriate means, stretching them at the same time, so as to keep the plates in line. Then the transverse wires *e'*



are drawn through the transverse channels of the said plates, thus forming a wire-netting inside the plates or tiles, which secures the plates in position and serves as a support of the same and the whole roof-covering. This combination with the fireproof netting forms an additional safeguard in case of fire, as the plates will prevent the action of the fire and the heat developed upon the netting placed inside of them.

Instead of arranging the channels inside of the plates or tiles they may be given the form of grooves open at the surface of the tile, preferably the lower surface of the same. In this case the wire-netting is first brought into position and the tiles placed upon it so as to have the wires *e* enter the vertical grooves, while the longitudinal wires *e'* are placed within the transverse grooves of the tile or plate. The grooves are then closed at the lower surface of the covering with mortar or other suitable binding material. This arrangement will effectually protect the wires against the action of temperature and atmospheric influences. In the same manner it is possible to construct flat vaulted roofs or cupolas, the tiles or plates being arranged either in parallel rows with the walls of the building between the walls and the ridge or top of the roof or in any other appropriate way. Besides using the netting of outstretched wires rafters may also be used as an additional security against the force of the wind and the pressure of the snow. In this case the construction may be greatly facilitated by attaching a ready-made wire-netting to the rafters instead of forming the netting on the roof itself, the wire-netting being stretched over the rafters from the ridge-purlin *A* to the purlins *a a* either in one piece or in sections, as shown in Fig. 5 of the drawings. In this case rafters *s* are arranged upon the purlins at such a distance from each other as will correspond to the width of the wire-netting. The lower edge of the wire-netting *d* is nailed or otherwise fastened to the purlin *a*, while the sides of the netting are attached to the rafters *s*, the upper edge of the netting being secured to the top purlin *A*. Care has to be taken to keep the wire-netting as taut as possible during the whole process of fastening it and to prevent any warping and deformation of the wires. Braces may be arranged directly within the netting or under the same for taking up any sag of the wires and to prevent bending. After the space between two contiguous rafters has been filled with netting the same work is repeated with the following spaces until the whole surface of the roof is covered with the netting. Of course it is by no means necessary to begin the operation at one end of the

roof, as the filling in of the several spaces with netting may be commenced from any point of the roof.

Referring now particularly to Fig. 6 of the drawings, in this arrangement the roof is provided with rafters *s* in the ordinary manner, which extend from the ridge-purlin *A* to the purlins *a* upon the walls of the building. Instead, however, of using laths the rafters are connected by horizontally - arranged taut wires *e'*, which serve for attaching the tiles or other roof-covering, the roof as a whole presenting an appearance similar to that illustrated in Fig. 2 of the drawings, with the only exception that rafters are used in place of the wires *e*, leading from the walls to the ridge of the roof; but even this construction where the base of the covering consists in part of combustible material is yet more fireproof than the ordinary wooden roof, inasmuch as the laths being thin are always first attacked by the fire, while the thicker rafters and beams will resist its action for a considerable time. By substituting for the wooden rafters metallic pipes or rails a perfectly-fireproof construction will be obtained by this construction likewise.

It is obvious that my invention may be varied in many other ways to suit existing conditions without, however, departing from its essential features as pointed out in the claims. A roof as constructed in accordance with my invention will be much more economical, simpler in construction, and of greater adaptability to all forms of covering and to all classes of buildings than ordinary wooden roofs or than roofs in which the laths have also been replaced by iron rails.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. In a roof construction, the combination with the roof-frame, of wires stretched upon the frame, and tiles or roof-plates formed with channels extending through the body thereof, said wires being tautly stretched upon the framework of the roof and passed through the channels of the tiles or roof-plates, thereby serving for their attachment and support, substantially as described and set forth.

2. In a roof construction, the combination with the roof, and wires supported thereon, of individual tiles or plates formed with channels to receive said wires to support the tiles or plates, substantially as set forth and described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

GEORG BRUCK.

Witnesses:

WOLDEMAR HAUPT,  
HENRY HASPER.