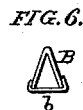
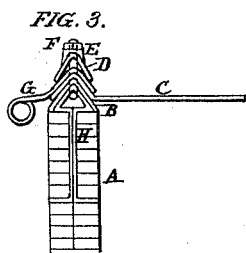
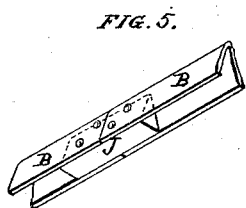
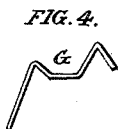
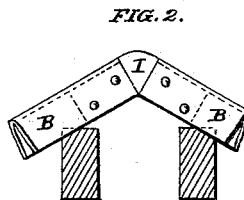
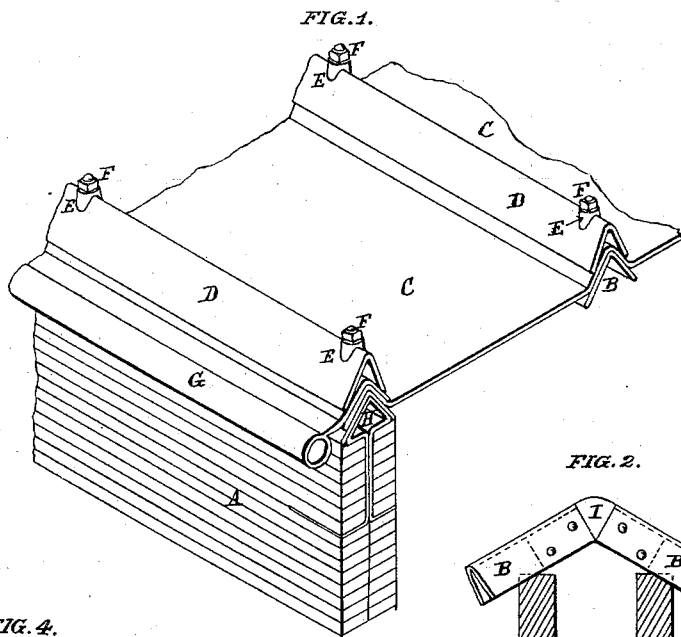


M. A. SHEPARD.

Roofs.

No. 164,602.

Patented June 15, 1875.



WITNESSES:

*Saml. Knight.*  
*Robert Burns*

INVENTOR:

*Morrill A Shepard*

# UNITED STATES PATENT OFFICE.

MORRILL A. SHEPARD, OF LEBANON, ILLINOIS.

## IMPROVEMENT IN ROOFS.

Specification forming part of Letters Patent No. **164,602**, dated June 15, 1875; application filed May 12, 1875.

*To all whom it may concern:*

Be it known that I, MORRILL A. SHEPARD, of Lebanon, St. Clair county, Illinois, have invented an Improvement in Iron Rafters or Supports for a Roof and Arrangement of Metal Roofing, of which the following is a specification:

The object of my invention is simply to securely connect sheets or slabs of metal to iron rafters or beams, so as to make a cheap fire-proof roof for buildings, &c., without any wooden rafters, supports, stays, or sheeting, which, connected with tin, metal, slate, or tile roofing, in the event of a fire, tends to shelter the fire from the labors of the firemen until those nominal fire-proof roofs fall in, and the flames burst forth to destroy other buildings; hence the special object of my invention, and arrangement of iron rafters and metal roofing, is that in case of a fire it will be confined to the building in which it occurred.

In giving a general description I would state that I have selected an angular or  $\Lambda$ -shaped bar, B, as shown in the accompanying drawings, for a rafter or beam, it giving a greater amount of strength than other forms of the same weight, and, if found necessary to keep the rafters in shape when under a heavy pressure or weight, I use the clamps or stays *b*, as shown in Fig. 6. These rafters are thoroughly secured to the walls of brick or stone buildings by anchors H, Figs. 1 and 3, and firmly spliced, when required, by the angular iron bar J, Fig. 5, and supported and firmly secured in a double roof by the curved angular bar or block I, Fig. 2. The roof C is formed out of sheets or slabs of wrought or cast iron or other suitable metal, with their right and left edges turned up in an angular form, so as to fit on the angular-formed rafter or beam, these angular forms making, when laid on the roof a high ridge, by which all the water is thrown onto the lower part of the plate, thereby providing against any possible chance of leaking. These sheets or plates of metal can be connected at their ends, when necessary, by hooking and doubling their edges, and then hammering them securely together, or if cast plates they may be lapped, and a narrow piece of heavy canvas thoroughly painted with lead, may be placed between the pieces, and

then securely bolted or riveted together, which will make a perfect water-tight joint.

Now, in order to secure these plates or slabs of metal to the rafters firmly, and yet in a manner so that they can readily be repaired or removed, I use bolts or rivets F F F F, Fig. 1, and F, Fig. 3, which pass through holes in the angle of the rafter and plates or slabs, and also through the clamp angular bar D, the angles of which are a little more contracted than those of the sheets or slabs, so that when the bolt is passed through and the washer E is put on the bolt F, and the nut is securely screwed down, the bar D will firmly press and clamp the plates together, yet in a manner that the sheets or slabs will not crack or break by contraction or leak by expansion. The saddle-washers E, Figs. 1 and 7, are so formed that no water can get through the holes, through which the bolts pass.

A return of the plate of the roofing may be made and fastened direct to the end of the building, or the last sheet may be formed into any desired shape to make an ornamental finish or cornice, as shown by G, Figs. 1 and 3, or in section, Fig. 4. I would suggest that all the pieces of metal used in the roof be placed for a time in boiling linseed-oil, pitch, or asphaltum before putting together; also, it will be advisable to thoroughly paint all the roof and rafters, both inside and outside, and keep them well painted.

Figure 1 is a perspective view of the brick or stone wall A, in which is placed the anchor H to secure the rafter and roof firmly to the wall. C is a section of a plate of the roof. G represents the last or finishing sheet of roofing formed into an ornamental finish or cornice.

Fig. 2 is a sectional view, showing the manner of connecting by bolts the angular iron rafters to the curved angular iron bar or block I.

Fig. 3 is a section of the wall, plate of roof, and cornice-piece, showing the manner in which the anchor is placed in the wall, and the fastening-bolt F holding all the plates, washer, and rafter together.

Fig. 4 is merely a section of the roof-plate, showing how cornice or finishing piece is formed to fasten to the roof and rafter.

Fig. 5 is a section of two angular rafters,

showing the manner of splicing to the connecting iron block J by bolts.

Fig. 6 is an end view of the rafter, showing the manner in which the clasp *b* is formed and put on in order to give said rafter more strength.

Fig. 7 is a view of the saddle-washer E to be placed under the tap of the bolt F to give said tap a firm rest or bed, and also to keep all water from getting through the hole around the bolt F.

I claim as my invention—

The angular or A-shaped iron rafter or beam B connected by an anchor, H, to the wall of the building, the roof-plates C, the clamp-piece D, bolts or rivets F, washers E, cornice G, the connecting-block I, the splice-bar J, all combined as shown, and for the purpose hereinbefore set forth.

MORRILL A. SHEPARD.

Witnesses:

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