B. F. POWERS & G. E. NEEDHAM.
Car-Roof.

No. 198,151. Patented Dec. 11, 1877

Fig. 1.

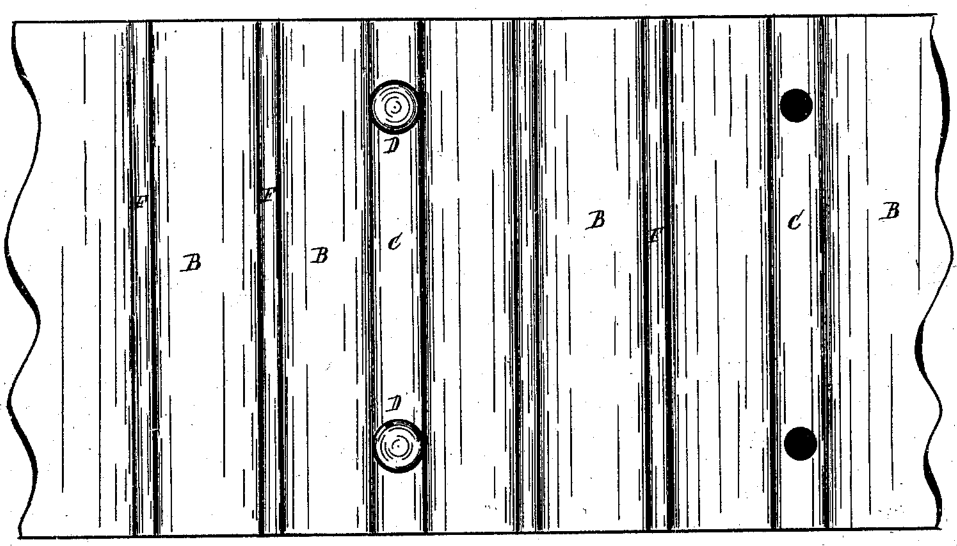


Fig. 2

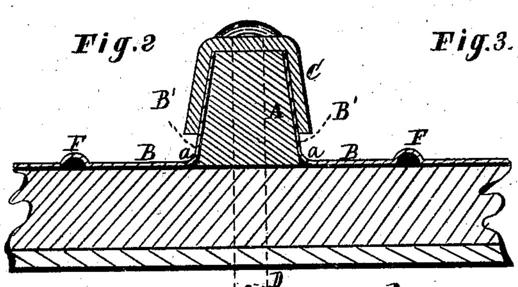


Fig. 3.

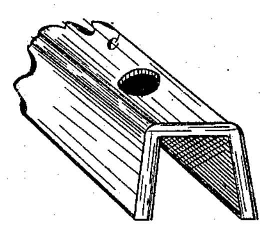
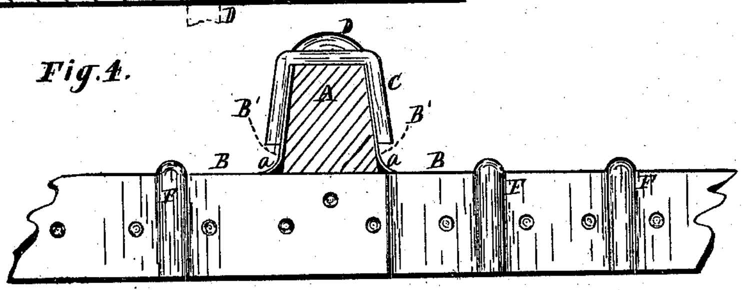


Fig. 4.



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UNITED STATES PATENT OFFICE.

BENJAMIN F. POWERS AND GEORGE E. NEEDHAM, OF CLEVELAND, OHIO.

IMPROVEMENT IN CAR-ROOFS.

Specification forming part of Letters Patent No. **198,151**, dated December 11, 1877; application filed September 1, 1877.

To all whom it may concern:

Be it known that we, BENJAMIN F. POWERS and GEORGE E. NEEDHAM, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and Improved Railway-Car Roof; and we do hereby declare that the following is a full, clear, and complete description thereof, reference being had to the accompanying drawings, making a part of the same.

Figure 1 is a plan view of the car-roof. Fig. 2 is a longitudinal vertical section. Fig. 3 is a detail view of the cap. Fig. 4 is a view of the eaves of the roof.

Like letters of reference refer to like parts in the several views.

This invention is a metallic roof for railway-cars, the construction of which is substantially as follows:

Said roof consists of a series of ribs or strips, A, attached to and supported above the body of the car by any suitable means.

It will be seen in Figs. 2 and 4 that the upper edge of the ribs or strips are narrower than at the base, thereby making the sides tapering upward. Said strips may be laid upon and secured to roof-boards covering the car.

B are sheets of metal, extending from the ridge of the roof to the eaves of the same, and to which eaves they are fastened by being bent down over them and thereto nailed, as shown in Fig. 4, or otherwise secured.

The two side edges of each plate or sheet of metal are bent upward at an angle, forming flanges B′, adapted to fit the sides of the strips A, against which they rest, and over which is secured the cap C by screw-bolts, as shown in the drawing.

Over the upturned edges of the sheets of metal and the strips is fitted a metal hood or cap, C. A detail view of a section of the cap is shown in Fig. 3. Said hood or cap is made of much stronger and thicker metal than the roofing-sheets, as will be seen in Figs. 2 and 3, and the sides thereof, being adapted to fit the tapering sides of the strips A, will, when put thereon, clamp the flanges or upturned edges of the sheets firmly to the sides of the strips, and are thereto secured by bolts D, passing down through the caps, strips, and roof-boards, as shown in Fig. 2.

To allow the sheets of metal to expand and contract by the changes of temperature without tearing or breaking away from the roof boards or strips, and also to prevent them from cracking and buckling, each sheet, between the flanges, is corrugated with one or more corrugations, F; also, to this end the flanges of the sheets are not turned at a sharp angle, but curved, as seen at *a*, Figs. 2 and 3; hence the roofing-sheets do not fit closely in the angle formed by the sides of the strips and the roof-board, there being a space in the corner. In this way a compensatory means is provided to prevent injury to the roofing in the event of their expansion and contraction by heat and cold, and also to allow the roofing to adapt itself to the twisting, racking movement of the car while in motion; hence the sheets cannot tear away from their fastening, nor become cracked and buckled thereby.

What we claim as our invention, and desire to secure by Letters Patent, is—

The flanged sheets B, having longitudinal corrugations F, and covered by cap-pieces C over the strips A, all fastened and secured by a single through-bolt, D, all constructed and arranged substantially as described.

BENJAMIN F. POWERS.
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Witnesses:
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