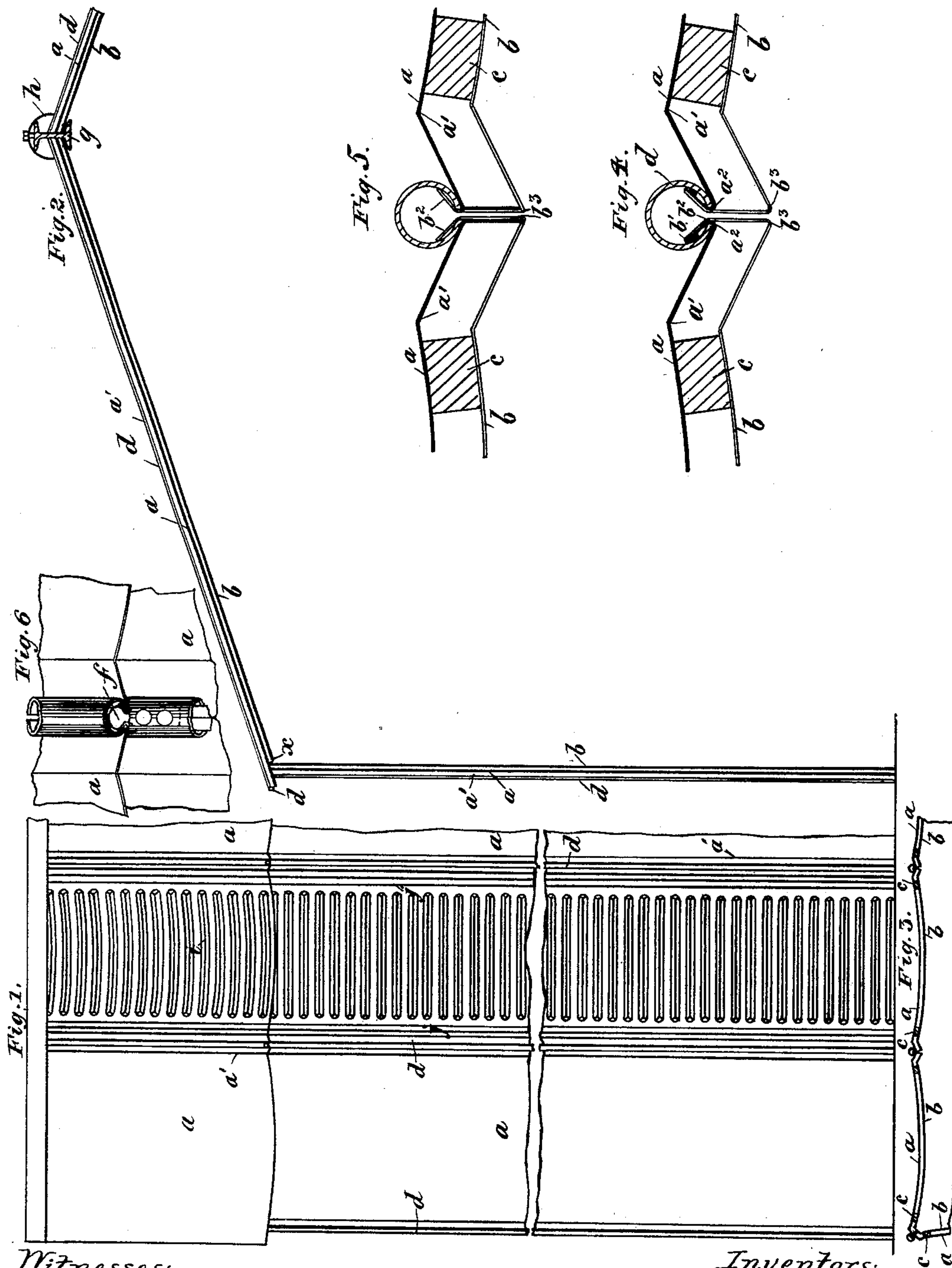


(No Model.)

W. ORR & P. S. BROWN.
SHEET METAL STRUCTURE.

No. 407,111.

Patented July 16, 1889.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM ORR AND PETER STUART BROWN, OF GLASGOW, COUNTY OF
LANARK, SCOTLAND.

SHEET-METAL STRUCTURE.

SPECIFICATION forming part of Letters Patent No. 407,111, dated July 16, 1889.

Application filed March 1, 1889. Serial No. 301,632. (No model.) Patented in England August 21, 1888, No. 12,038.

To all whom it may concern:

Be it known that we, WILLIAM ORR, merchant, and PETER STUART BROWN, manufacturer, both subjects of the Queen of Great Britain and Ireland, residing at Glasgow, county of Lanark, Scotland, have invented new and useful Improvements in Sheet-Metal Structures, (which have not been patented in any country except Great Britain, by Letters Patent dated August 21, 1888, No. 12,038;) and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the manufacture or art to which it relates to make and use the same.

This invention, which relates to metal structures composed of plain or corrugated galvanized iron or other metal sheets, has for its object to provide a double-cased anti-thermal structure in a simple and more economical manner than has heretofore been obtained. The double casing is, under the present invention, composed of panels each consisting of two plain or corrugated sheets, the edges of the sheets being so folded as to grip, hold upon, or butt against each other, the sheets being maintained at the required distance apart by distance-strips or their equivalents, while the series of panels constituting the structure are bound or held together by entering their edges into a slot extending throughout the length of a tube of incomplete section, in which slot they are maintained by squeezing or flattening in the edges of the slot, or by clips, wedges, or fasteners inserted at suitable distances apart.

On the accompanying drawings, Figure 1 is a part side elevation of a building composed of anti-thermal panels constructed and held together in accordance with our said invention. Fig. 2 is a part transverse section of Fig. 1. Fig. 3 is a part horizontal section of Fig. 1. Fig. 4 is a detail horizontal section, drawn to a larger scale, showing one mode of constructing and joining the panels. Fig. 5 is a modification of Fig. 4. Fig. 6 shows a method of connecting the roofing-panels to those constituting the walls of the building.

In carrying out the invention as regards the construction of the anti-thermal panels, two

plain or corrugated galvanized iron or other metal sheets *a b*, Fig. 4, are used, the sheets *a* at the part *a'* being bent at an angle to the body of the sheet, which body may either present a flat surface or convex surface, or a concave surface, as shown. Near the edges the parts *a'* are bent back or returned, as indicated at *a''*, and over the said returned portions the edges of the inner sheets *b* are bent, as shown at *b' b''*, the sheet *b* from the point *b''* extending straight inward to the point *b'''*, where it is again bent, so as to lie parallel with the part *a* of the outersheet. The body of the sheet *b* is also parallel to or curved to correspond with that of the sheet *a*, the two sheets being maintained at the desired space apart by the insertion of distance strips or pieces *c*, or by rivets, bolts, or their equivalents. The parts *a''* and *b''* of the sheets may also be bolted or riveted together, if desired, though in ordinary circumstances the overlapping bend *b'* is sufficient to hold them securely together.

Into the space inclosed by the double casing sawdust, or any other non-conducting material, is or may be introduced, or the said spaces may be left free for the circulation of air-currents or of heated air, gases, or steam. In joining two panels constructed as hereinbefore described together the straight parts of the sheets *b* between the points *b'' b'''* are brought up to or butted against each other, and a tube *d*, having a slot extending throughout its length, is slipped over at the bend where the return *a''* of the sheets *a* commence, the joint being made tight by pressing inward the edges of the slot in the tube or by the insertion of wedges or clips between the sheets *b* where they pass through the slots.

In joining a section of the double sheeting constituting a part of the side or wall of the structure to a section constituting a portion of the roof, a part of the inner sheet *b* of the roof is cut away, as indicated at *x*, Fig. 2, to enable the outer roofing-sheet *a* to overlap the outer sheet *a* of the corresponding wall-section, and so maintain the space between the sheets throughout both sections. The lower ends of the tubes *d* uniting the roofing-sections are fastened to the tubes uniting the

wall-panels by a clip or fastener, as indicated
 at Fig. 6, the said fastener having a head f
 the breadth of which is sufficiently narrow to
 enable it to be entered into the slot of the
 5 roofing-tube d . After being so entered the
 fastener is turned round a quarter of a circle,
 so as to bring the length of its head across the
 slot, as shown, after which the lower part of
 the fastener is riveted, bolted, or otherwise
 10 secured to the vertical tubes d uniting the
 walls, or any other convenient fastener may
 be adopted. To support the upper ends of
 the roof-tubes d , they are or may be rested
 upon or secured to the lower flange of a
 15 double channel-iron g , a cap or cover h being
 bolted or riveted to the upper flange of the
 said iron to render the joint water-tight.

Fig. 5 illustrates a modified arrangement
 for connecting the outer and inner sheets of
 20 the anti-thermal panels together, and in which
 case the ends a^2 of the sheets a are bent in-
 ward, so as to lie against the straight parts b^3
 of the sheets b , to which they may be bolted
 or riveted, if desired, the ends b^2 of the sheets
 25 b being flared and inclosed within the slotted
 tube d in connecting the panels, as before set
 forth.

The sheets used in constructing the anti-
 thermal panels may be ordinary flat or cor-
 30 rugated sheets; but it is preferred that they
 should be corrugated, as indicated at Fig. 1
 of the drawings—that is to say, with a series
 of cross-corrugations i , terminating short of
 the edges of the sheets, in addition to which
 35 corrugations j may be made between the ends
 of the cross-corrugations and the edges of the
 sheets.

Having now described our invention, what
 we desire to claim and secure by Letters Pat-
 ent is—

1. For use in the erection of metal struct-
 ures, an anti-thermal panel composed of two
 plain or corrugated sheets whose edges are
 bent or folded so as to grip hold upon each
 other, the sheets being maintained at required
 45 distances apart by distance-strips, bolts, rivets,
 or equivalents, and the space between them
 being filled in or not with a non-conducting
 material, substantially as described.

2. For use in the erection of sheet-metal
 50 structures, an anti-thermal panel composed
 of two plain or corrugated sheets whose edges
 are so folded that the bent ends of one sheet
 butt against bends near the ends of the other
 sheet, the extremities of the second sheet be-
 55 ing flared over the bend of the first-mentioned
 sheet, and the sheets being maintained at re-
 quired distances apart by distance-strips,
 bolts, rivets, or equivalents, the space between
 them being filled or not with non-conducting
 60 material, substantially as described.

In witness whereof we have hereunto set
 our hands and seals this 27th day of Septem-
 ber, 1888.

WILLIAM ORR. [L. S.]
 P. STUART BROWN. [L. S.]

Witnesses:

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