

No. 613,599.

Patented Nov. 1, 1898.

E. L. PEASE.

STRUCTURAL ARRANGEMENT FOR COMBINING STRENGTH WITH RIGIDITY FOR
ROOFING OR FLOORING.

(No Model.)

(Application filed Dec. 23, 1897.)

2 Sheets—Sheet 1.

FIG. 1.

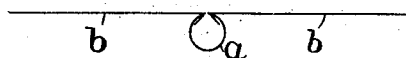


FIG. 2.

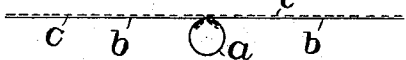


FIG. 3.

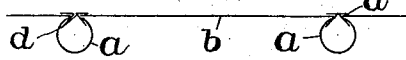


FIG. 4.

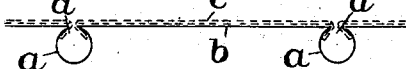


FIG. 5.

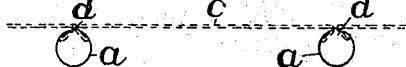


FIG. 6.

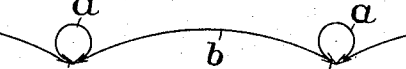


FIG. 7.

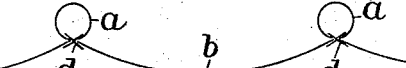


FIG. 11.



FIG. 8.

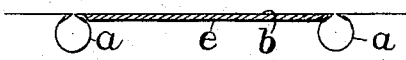


FIG. 9.

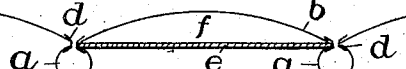


FIG. 10.

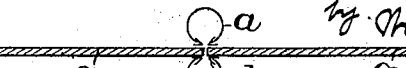
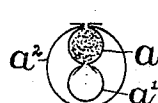


FIG. 12.



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(Application filed Dec. 23, 1897.)

(No Model.)

2 Sheets—Sheet 2.

FIG. 13.

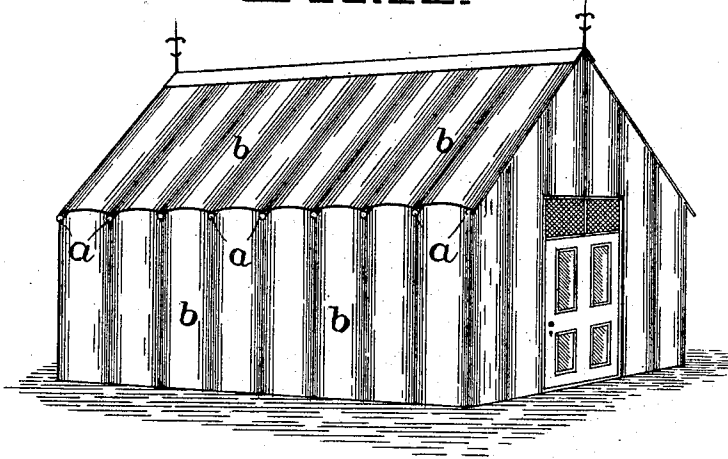


FIG. 14.

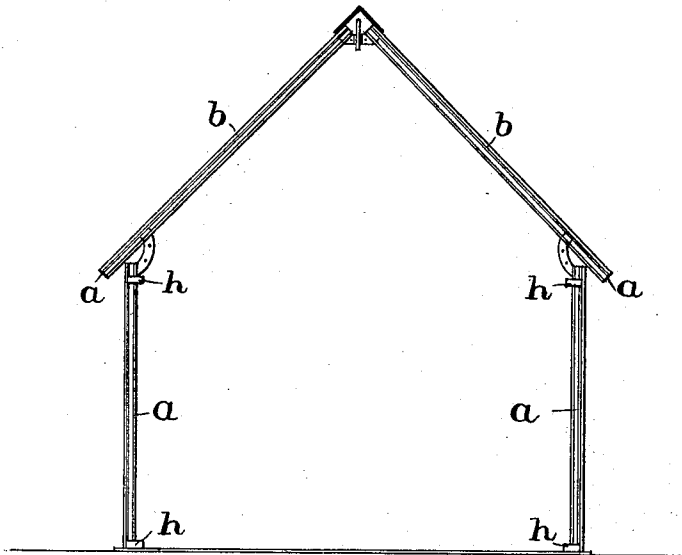
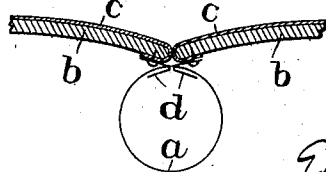


FIG. 15.



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UNITED STATES PATENT OFFICE.

EDWARD LLOYD PEASE, OF HURWORTH-ON-TEES, ENGLAND.

STRUCTURAL ARRANGEMENT FOR COMBINING STRENGTH WITH RIGIDITY FOR ROOFING OR FLOORING.

SPECIFICATION forming part of Letters Patent No. 613,599, dated November 1, 1898.

Application filed December 23, 1897. Serial No. 663,213. (No model.)

To all whom it may concern:

Be it known that I, EDWARD LLOYD PEASE, a subject of the Queen of Great Britain and Ireland, residing at Hurworth-on-Tees, in the county of Durham, England, have invented certain new and useful Improvements in Structural Arrangements for Combining Strength with Rigidity in a Manner Applicable to Flooring, Walling, and the Like Structural Purposes, (for which I have received patents in Great Britain, No. 21,331, dated September 26, 1896; Hungary, No. 1,602, dated March 19, 1897; West Australia, No. 1,557, dated March 10, 1897; South Australia, No. 3,614, dated April 20, 1897, Transvaal, No. 1,373, dated April 13, 1897; New South Wales, No. 7,417, dated April 23, 1897; Cape Colony, No. 1,329, dated April 13, 1897, and France, patent of addition, No. 253,048, dated March 27, 1897;) and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention comprises certain improvements and novel features which are applicable with advantage to various kinds of structural arrangements of the kind described in my Letters Patent No. 540,186, dated May 28, 1895, for combining strength with rigidity in the manner required for roofing, walling, tanks for holding water, and the like structural purposes in which open or slotted tubular vessels or their equivalents or substitutes are employed with other sections of iron, steel, wood, or the like strain-resisting material, including canvas, in the manner and with the objects as hereinafter described.

The means for carrying my invention into effect are to be understood from the following description, taken with reference to the drawings hereto annexed, and are characterized by a simplicity of parts which are detachable and portable and by the easy means of interlocking and compacting them into one structure in the construction of houses, sheds, tents, or the like permanent or temporary structures, for which purposes such structural arrangements can be made weather-proof and otherwise adapted for their intended purpose by the use of outer coverings and inner linings of various materials in di-

rect contact with the iron plates or other constructive materials used, or as an inner lining stretched across from joint to joint to form air-spaces, or as a double or internally-lined wall.

Figure 1 illustrates in transverse section a wall or roof construction in which open tubular vessels or slotted tubes *a*, spaced at intervals like beams or posts for interlocking sheets *b* of strain-resisting material, which span the said intervals of space and are straight or flat, as shown, or are curved or arched in some cases to stiffen them. These sheets are provided with inset flanges along their edges to thread into the slotted tubes, the sections being brought together to form a close joint.

Fig. 2 is a similar view to Fig. 1, but in this case the metal sheets are covered with a non-conducting material *c*—such as felt, canvas, or the like material—similarly secured or interlocked along their edges and strained to serve as a weatherproof covering.

In Fig. 3 a transverse section of a wall or roof construction is shown in which the interlocking is effected by means of separate or detached angle bars or strips *d d*, which take the place of the inset flanges and are threaded into the slotted tubes *a*, with the other edge in each case projected outward to engage with and take the thrust of the intervening sheet *b*, or the sheets *b* may be attached to the angular strips *d*, if desired. In this case the trouble of bending the sheets themselves is saved.

Fig. 4 is a similar view to Fig. 3 with a covering *c* of a non-conducting material—such as felt, canvas, or the like material—so as to make a completely weatherproof structure, and the covering *c* may be pinned or otherwise attached to the strips *d*.

Fig. 5 illustrates a structural arrangement which may be employed for temporary purposes, such as a tent, in which case the open tubular vessels *a* are fixed in position and interlock the angular strips *d*, together with the canvas or felt *c*, which is stretched in the manner shown. On the outside of the non-conducting covering wire-mesh netting may be fixed in a similar manner to the felt for the protection of same from damage and to keep it in position.

In Figs. 6 and 7, which illustrate my structural arrangements as adapted for roofs whether concave or convex, the open tubular vessels *a* are interlocked by means of the angular strips *d*, with a cambered sheet *b* inserted between. In this case it is not necessary to cover the structure with a non-conducting material, as the tubes are external to the sheets, and in that position are sufficient by themselves to keep the joints weatherproof. I do not limit myself to metal sheets *b*, as hereinbefore described, but can use strawboard with good results and various vegetable, mineral, and composite slabs. The metal strips *d* may be attached to the strawboard or the latter may be inserted in a cambered form.

In Figs. 8 and 9 the building is lined with panels *e* of suitable material—such as fibrous plaster, strawboard, or canvas—either inserted between the tubular connecting-pieces, as shown in Fig. 8, or stretched in tension between the angle-pieces, as shown in Fig. 9. This gives a light and inexpensive double wall with an air-space *f* in between, when the construction takes the form shown in Fig. 9.

Fig. 10 illustrates a construction of walling in which two timbers *g* are connected to the angular strips *d*, and are thereby interlocked with the slotted tubes *a*.

Fig. 11 illustrates the angular strips *d* interlocked with two slotted tubes *a a'*, and Fig. 12 illustrates three tubes interlocked together. In this case a special strip *a* is formed with its edges turned over and interlocked by the inner and outer tubes *a' a''*, the space in the tube *a* being filled with a suitable packing. These constructions afford a better security and water-tightness.

Fig. 13 is a perspective view, and Fig. 14 a transverse sectional view, of a covered-in structure or house, showing the connection of the walls and roof which embody the structural arrangement which constitutes my invention, as illustrated in detail in Figs. 1 and 2. Where no lining is required in the house, this design makes a very cheap and easily-erected structure. The joints are made by the open tube *a*, which is sufficiently substantial to bring the two ordinary portions or strips *b* very tightly together when the said tube *a* is driven on or into position from above. When a felt or other covering is used, this joint is absolutely weatherproof, and it is thus possible to construct without a rivet and with very few bolts a house to a great extent protected from external changes of temperature. This house is easily taken to pieces. The weight of the tubes which give vertical strength to the wall is small and they are inexpensive. They are connected together laterally by light timbers *h* at the top and bottom, and these may also serve for nailing a wood lining to, if desired.

Fig. 15 illustrates in transverse section a construction especially applicable for roofs in which a waterproof cover *c* is stretched

over wood-pulp board *b*. The edges of this cover are tucked in between the board *b* and the metal strip *d*, which is sewed with wire and the whole interlocked by the tube *a*. The construction is not confined to the use of "circular tubular vessels," properly so called, and these may be considerably varied in form—as, for instance, a triangular form in cross-section—so long as the form used comprises the properties of an open or slotted hollow beam, into which an angle-edged plate or angle-strip can be threaded for interlocking the several parts into one structure. It is also obvious that corrugated plates may be substituted for even or ordinary plates, and when used with an inner lining air-spaces are inclosed by the said lining between the corrugations. The special advantages to be derived from this construction are greater portability of the several parts and facility for transport, together with facility of covering the metal sheets with felt, canvas, or the like material, and so making such structures weatherproof and waterproof and adapted to be used for permanent or temporary occupation or for the housing of cattle or agricultural produce or for water-tanks and the like receptacles.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In the construction of roofs, walls, tanks and the like, the combination with longitudinally-slotted metal tubes; angle-strips *d* held within the slots of said tubes, and waterproof panels secured at their edges to the said angle-strips, substantially as described.

2. In the construction of roofs, walls, tanks and the like, the combination with longitudinally-slotted metal tubes; angle-strips *d* held within the slots of said tubes, and metal panels with their edges secured between said angle-pieces and said tubes, substantially as described.

3. In the construction of roofs, walls, tanks and the like, the combination with tubular metal beams, each having a continuous longitudinal slot therein; angle-strips *d* threaded in said slots, and metal panels lined with fabric and secured at their edges between said angle-pieces and the outside of said tubular beams, substantially as described.

4. In the construction of roofs, walls, tanks and the like, the combination with a tubular metal beam having a continuous longitudinal slot therein; a smaller tube inclosed in the first tube and having a continuous longitudinal slot which registers with the slot in the first tube, and angle-pieces threaded in the slots of both tubes for holding the structure together, substantially as described.

5. In the construction of roofs, walls, tanks and the like, the combination with tubular metal beams *a*, each having a continuous longitudinal slot therein; angle-strips *d* threaded in said slots, and metal panels lined with canvas and secured at their edges between said

angle-strips and said tubular beams, substantially as described.

6. In the construction of roofs, walls, tanks
and the like, the combination with tubular
5 metal beams, each having a continuous longitudinal slot therein; angle-strips threaded in the slots of said beams, and panels of waterproof material with their edges held between the angle-pieces, of tubular beams lo-

cated on the outside of said panels and the 10
angular pieces of tubular beams located inside of said panels, substantially as described.

In testimony whereof I affix my signature
in presence of two witnesses.

EDWARD LLOYD PEASE.

Witnesses:

GEORGE JAMES CLARKSON,
EDWARD THOMAS ELCOAT.