

(No Model.)

2 Sheets—Sheet 1.

E. L. PEASE.

STRUCTURAL ARRANGEMENT OF FLOORING, WALLS, &c.

No. 540,186.

Patented May 28, 1895.

Fig. 1.

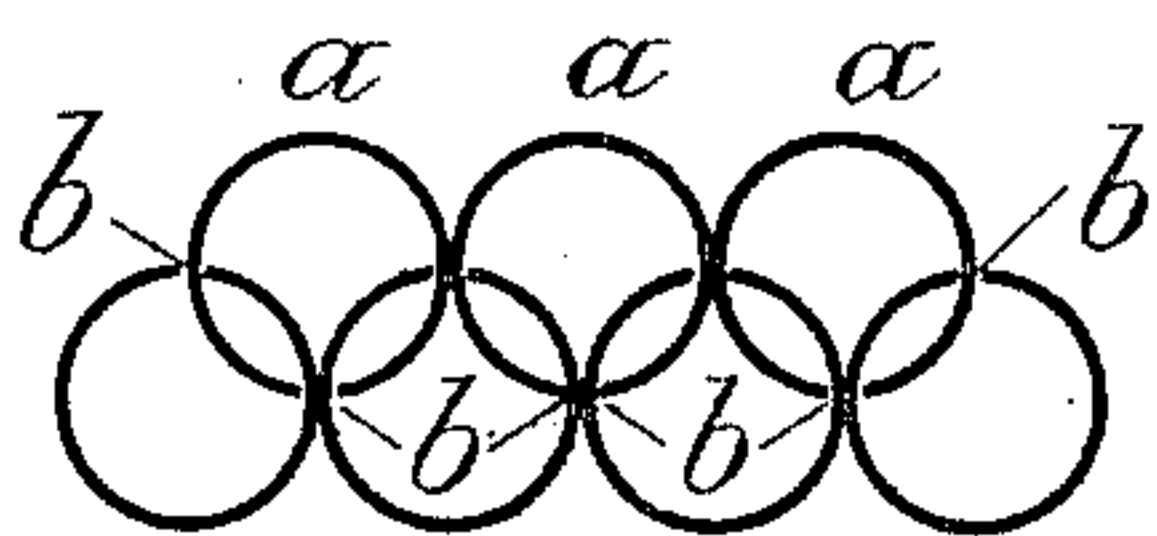


Fig. 2.

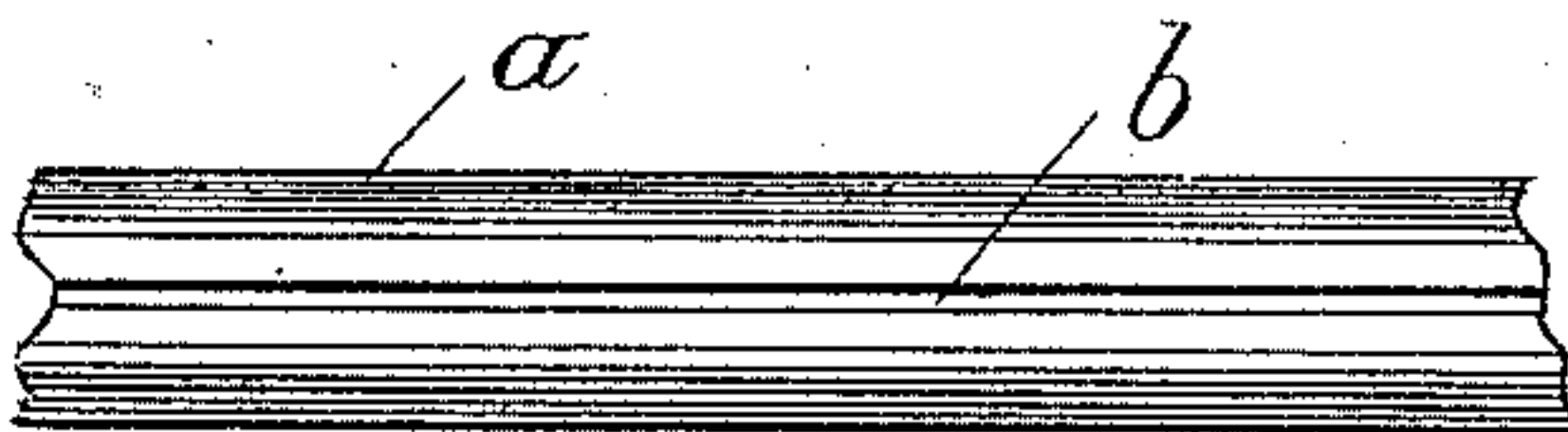


Fig. 3.

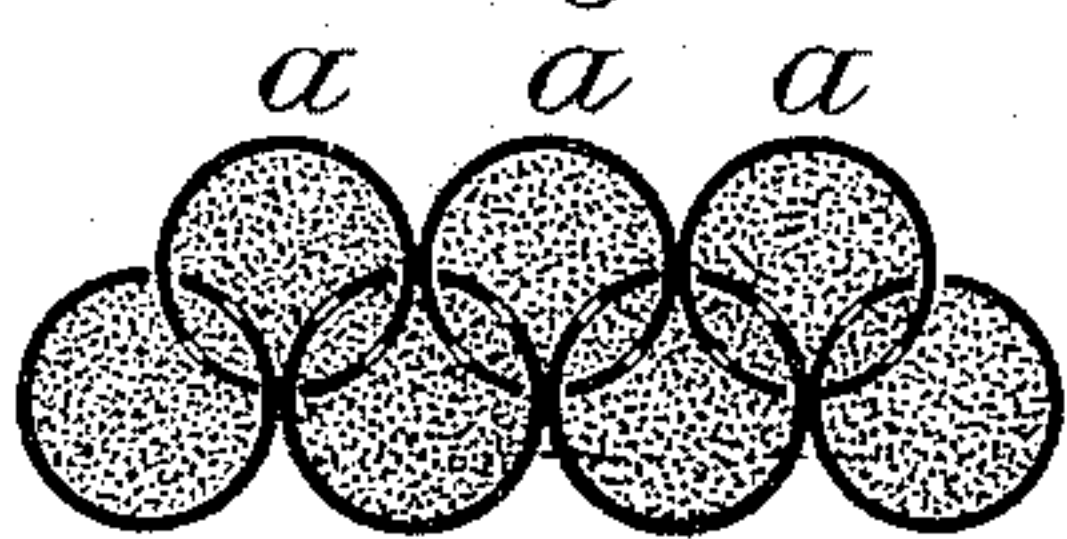


Fig. 9.

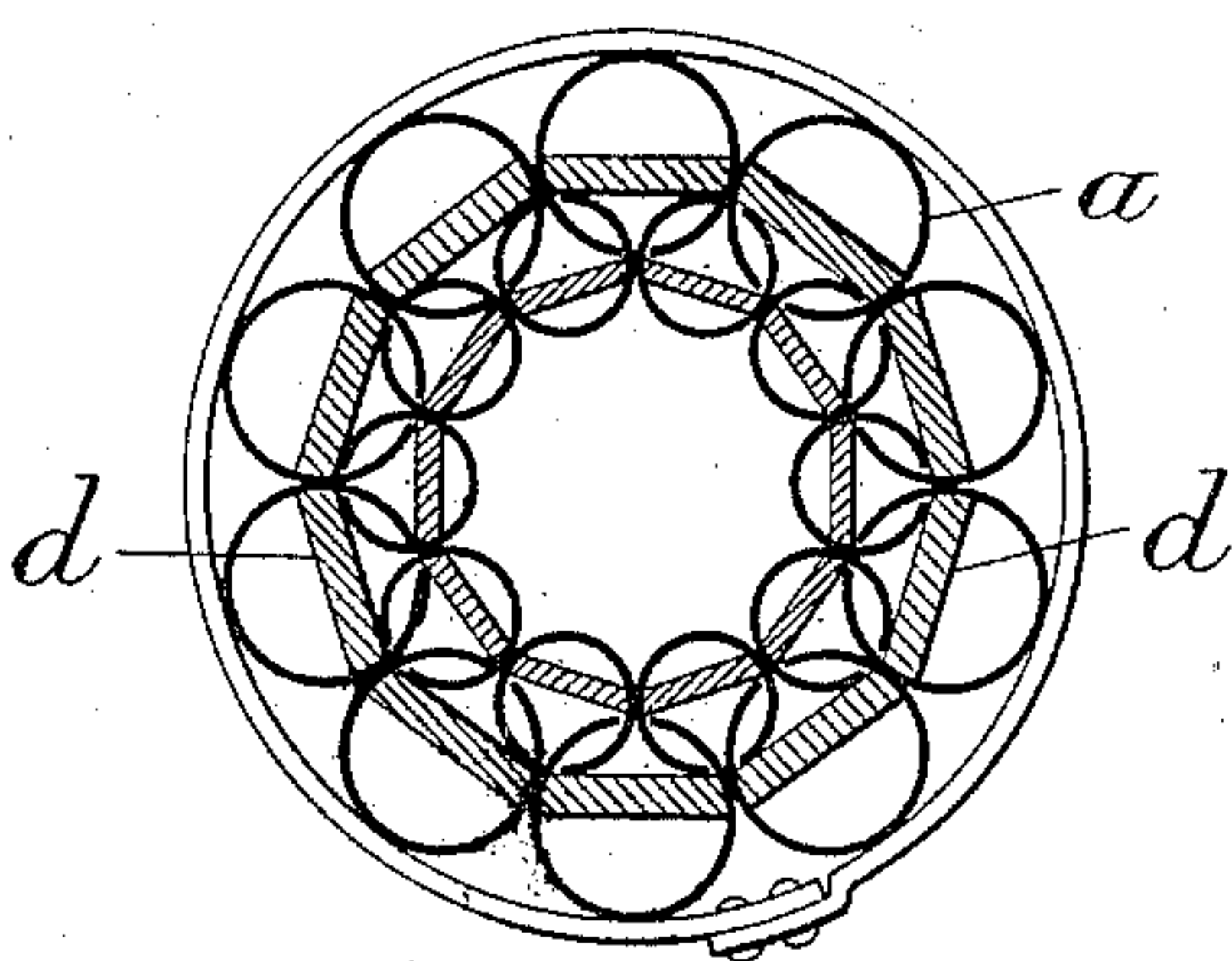


Fig. 5.

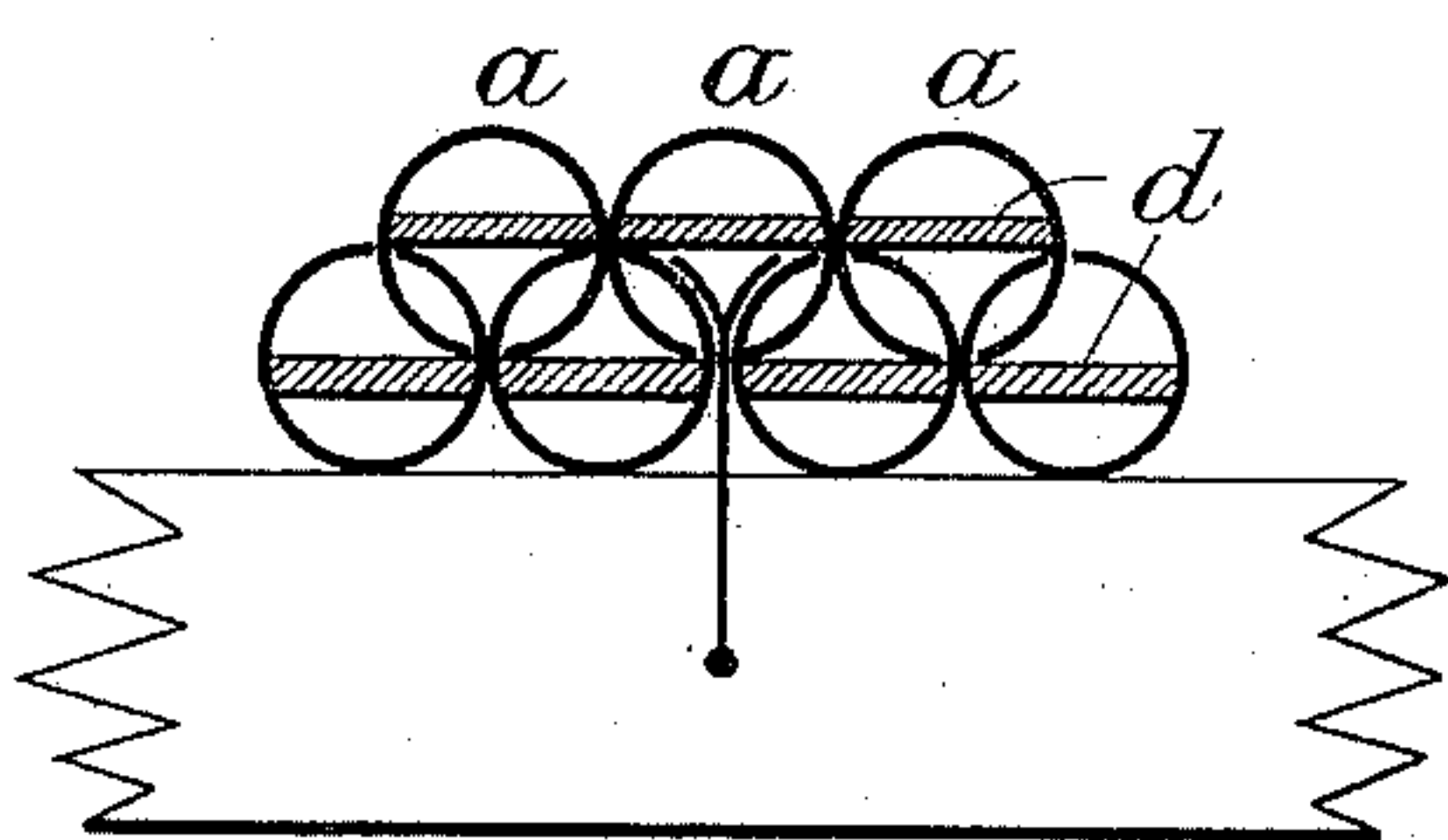


Fig. 10.

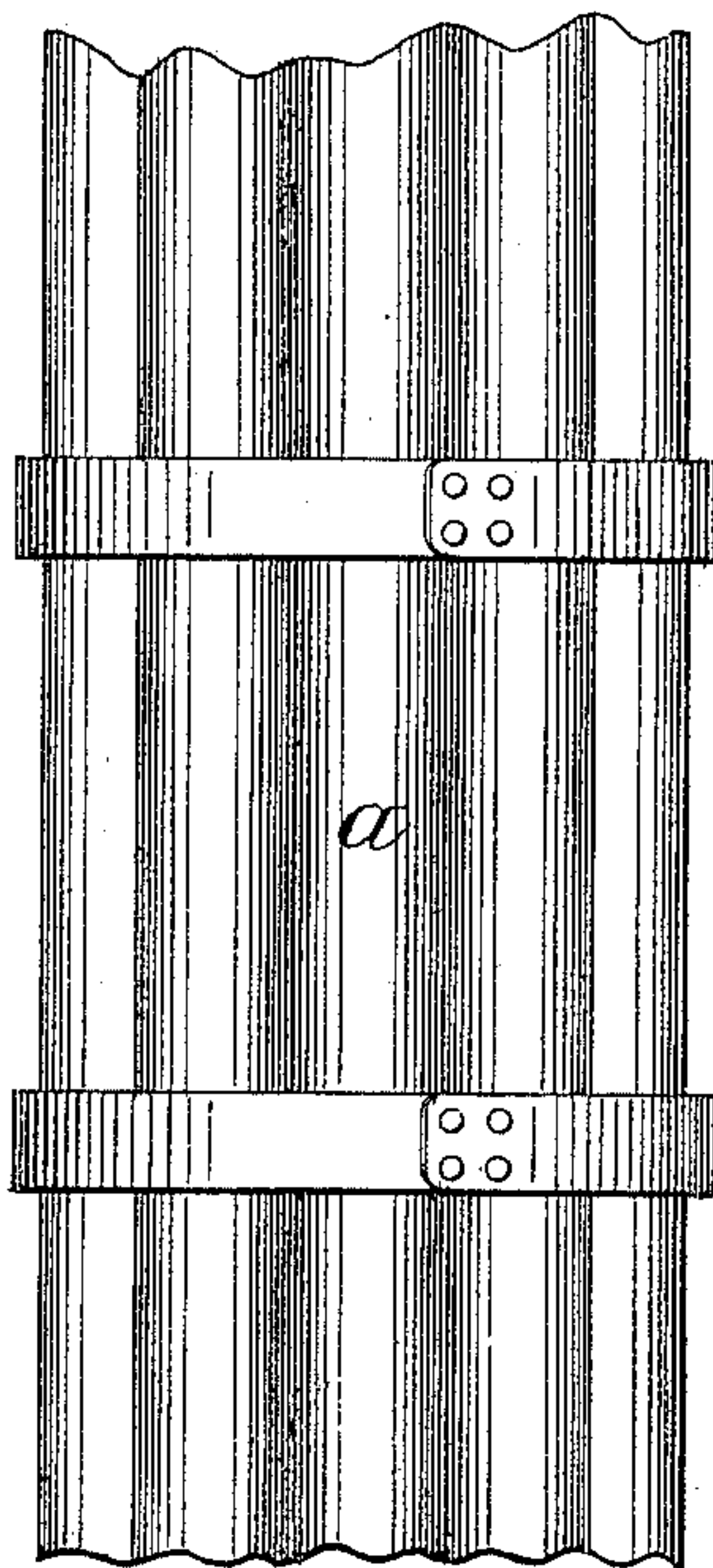


Fig. 4.

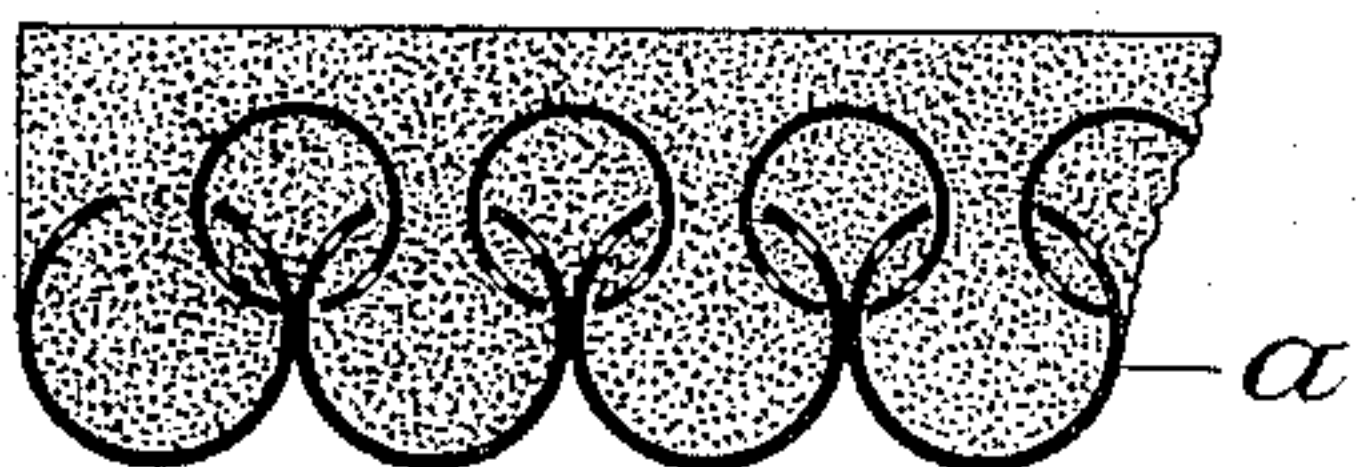
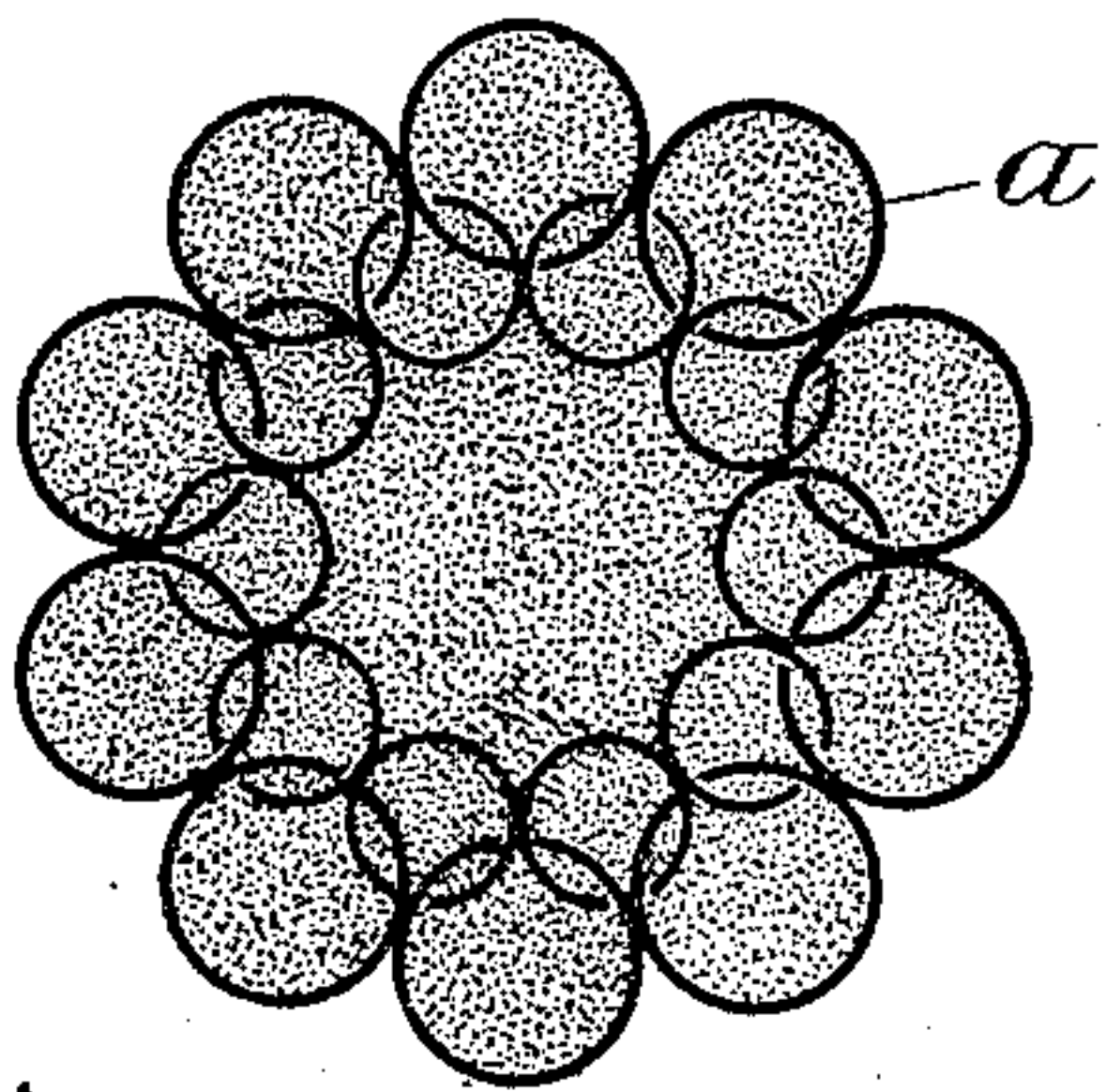


Fig. 8.



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Fig. 7.

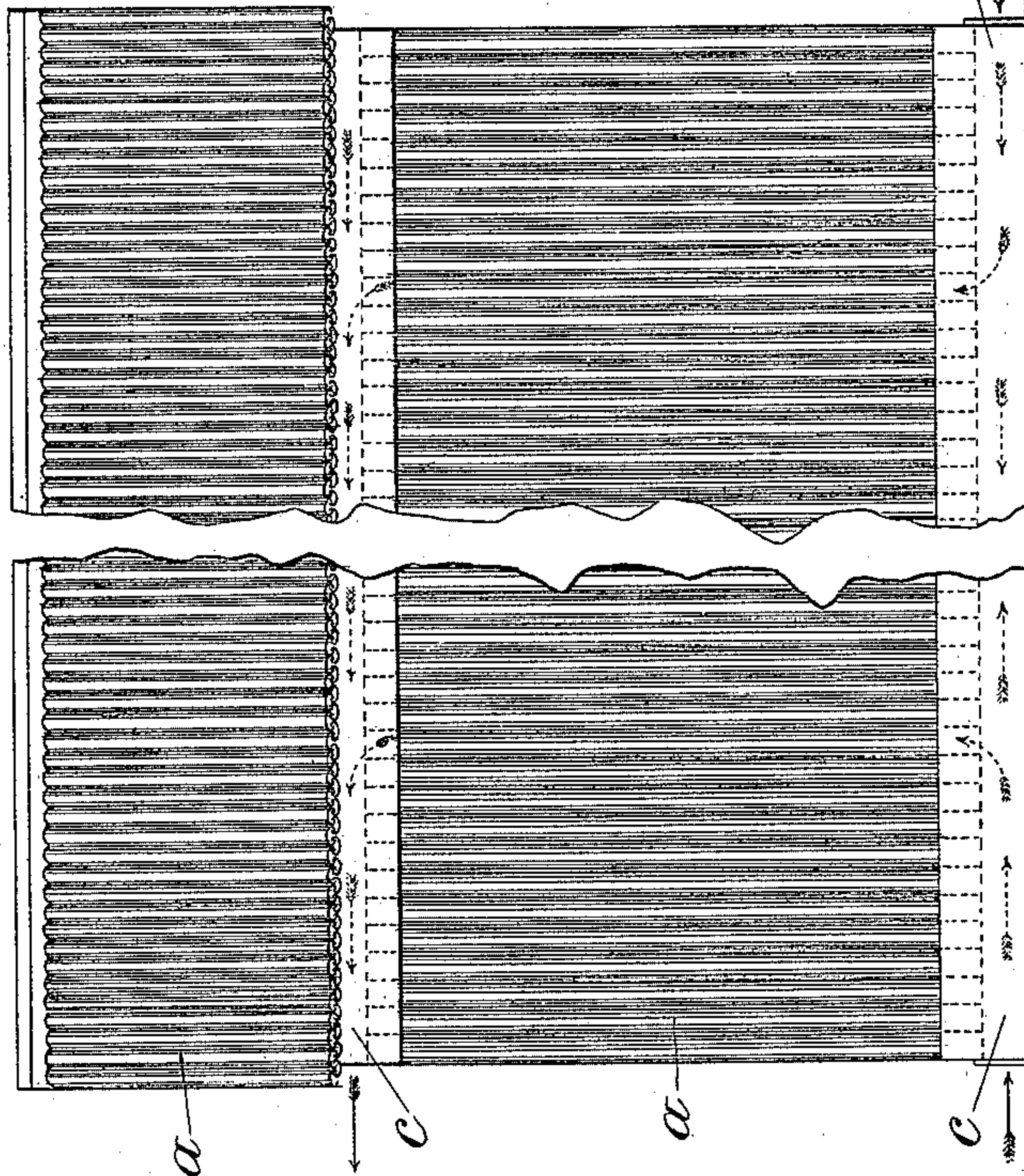
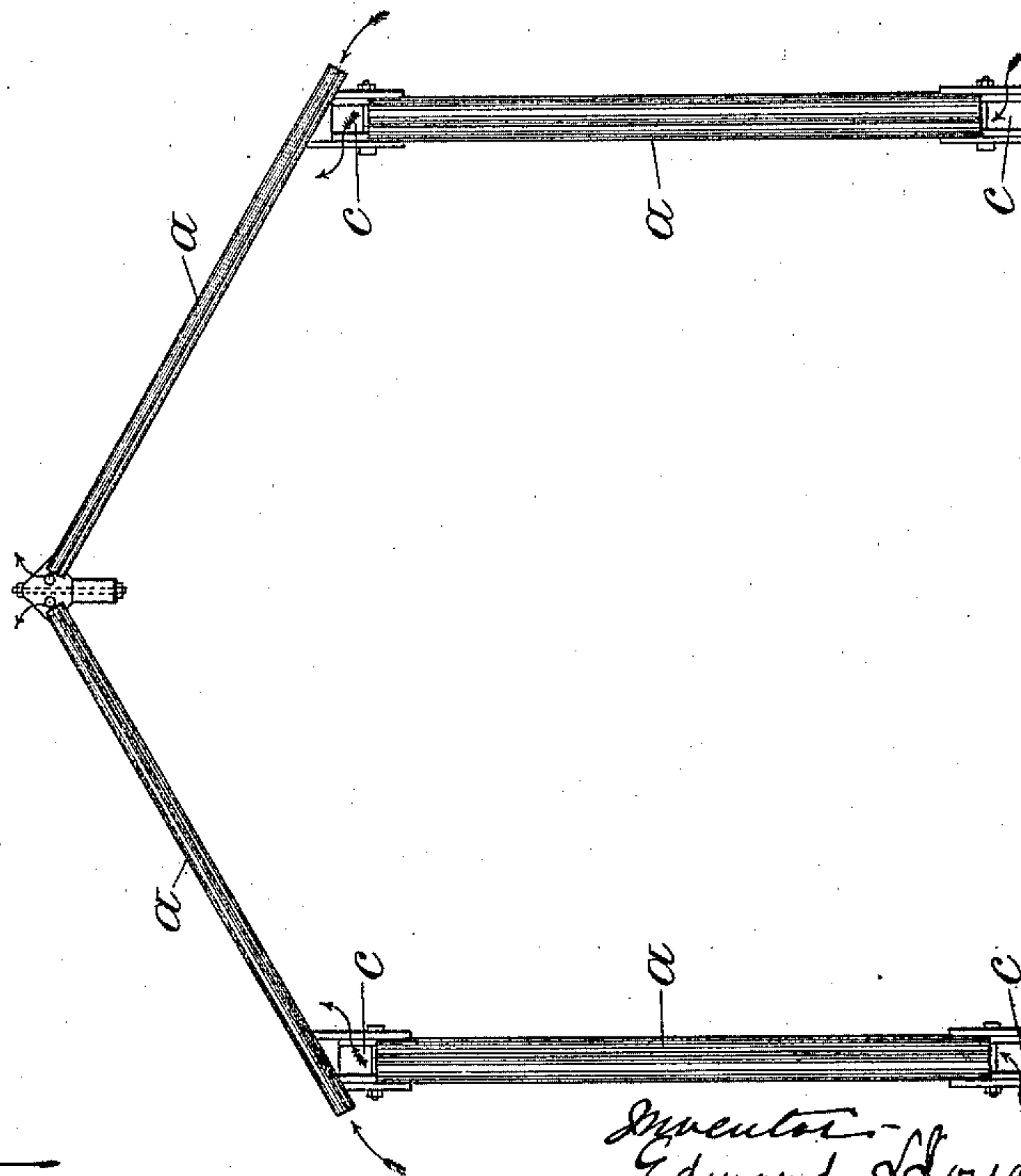


Fig. 6.



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UNITED STATES PATENT OFFICE.

EDWARD LLOYD PEASE, OF HURWORTH MOOR, ENGLAND.

STRUCTURAL ARRANGEMENT OF FLOORING, WALLS, &c.

SPECIFICATION forming part of Letters Patent No. 540,186, dated May 28, 1895.

Application filed October 23, 1894. Serial No. 526,768. (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 Moor, 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, or other Structural Purposes; 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 relates to a structural arrangement for combining strength with rigidity in the manner required for flooring, walling, and other structural purposes, including caisson and deep water piers.

In carrying this invention into effect I apply what may be termed the cellular principle in the form of interlocked tubular vessels of some material capable of standing a high tensile strain, such as iron or steel rolled from the flat into the cylindrical form, but with the edges apart in the form of a longitudinal slot running lengthwise of the tube so that a second tube with a like longitudinal slot can be partially inserted edgewise into the first tube, and in its turn similarly receive the like part of a third tube, and so on until a series of such tubes are engaged or clasped together in a manner which interlocks all the intermediate tubes. In this way the said tubes constitute a structural arrangement which has more or less strength and rigidity imparted to it according to the particular purpose or use for which the said structural arrangement is intended and ranging from the use of some hard setting material like cement charged into the tubes to their full capacity to the use of the tubes by themselves or with internal stiffeners only.

I have illustrated in the drawings forming part of this specification the essential features of my invention together with some of the uses to which it is applicable.

In Figure 1 the structural arrangement consists of a series of empty tubes which are shown transversely and interlocked in the manner embodying my invention, corresponding to which Fig. 2 is an elevation of a single

tube taken longitudinally and showing the slot for receiving a second tube. Figs. 3 and 4 are similar views to Fig. 1, but showing the tubes fully charged in Figs. 3 and 4 with some hard-setting material, such as cement, the slots being shown wider in Fig. 4 to afford a greater sectional area of cement at the part which unites the cement within the tube to the body of cement without, and in Fig. 5 furnished with internal stiffeners only in the form of planks of timber or their equivalents. Figs. 6 and 7 illustrate a covered-in structure, the walls and roof of which embody the structural arrangement which constitutes my invention. Figs. 8 and 9 illustrate a combination of tubes of different diameters interlocked in the form of a circular structure, such as a deep-water pier or column; and Fig. 10 is a vertical elevation corresponding to the transverse sectional views in Figs. 8 and 9.

Referring to the several figures in which like letters of reference are used throughout, it will be observed that each tube *a* is furnished with a longitudinal slot *b* extending its full length, the edges of which are preferably brought as near together as will just admit of the thickness of a similar tube, unless a wider slot is required as in the case of Fig. 4, the several tubes constituting a particular structural arrangement being inserted edgewise into and interlocked with each other in the manner shown.

Where the absence of weight and the facility for passing currents of air through the tubes or for loosely charging them with a non-conducting material is the main object in view and the power to resist high tensile or compressive strains comparatively immaterial the tubes are simply interlocked together without internal stiffeners as shown in Fig. 1, and in this form are serviceable for use as forming the walls and roof of a shed or building.

Referring to Figs. 6 and 7 the tubes *a* are fixed between and communicate endwise with the horizontal flues or air passages *c* with the object of inducing a constant and natural current of air through the tubes for keeping the interior of the shed or room cool in hot climates. Similarly the tubes in the roof are left open from end to end with the same object and are preferably slung together by wire ties to prevent individual tubes from slipping

out of position. On the other hand the same shed or house is adapted to a cold climate by loosely charging the tubes with some non-conducting material; but when the structural arrangement is required to combine high powers of resistance to strains of every kind whether tensile or compressive, I charge the tubes to their full capacity as shown in Figs. 3 and 4 with some hard setting material such as cement and in this way I constitute a structural arrangement which combines the capacity to resist tensile strains due to the tensile qualities of the interlocked tubes with a rigidity due to the hard setting material to which these tubes serve as so many envelopes, and strengthen this combination in some cases by enabling the material in adjacent tubes to become united at various points of contact by oozing through perforations and apertures provided in corresponding parts of the several tubes.

It will readily be seen that the above combination brings out to great advantage both the tensile properties of the tubes and the rigidity or resistance to compression of the enveloped material. Where a lower capacity for resisting strains is sufficient I substitute for the solid charge of hard setting material as shown in Fig. 3, the stiffener *d* as shown in Fig. 5, consisting of planks of wood or the like extending across the full width of the tube.

The tubes are varied in diameter or cross section relatively to each other according to the nature and purpose of the structural arrangement in view, being preferably of equal diameter or cross section for a floor of uniform thickness in which they would be placed in

the horizontal position, or in a wall of uniform thickness in which they would be placed in the vertical position, but for the purpose of constructing a column, caisson or deep water pier the outer tubes are interlocked by inner tubes of a smaller diameter in the manner shown in Figs. 8 and 9, in which a circular structural arrangement is shown as representing such structural arrangements generally.

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

1. A structural arrangement consisting of a series of tubular vessels each having a longitudinal slot running lengthwise of the tube into which a second tube with a like longitudinal slot is inserted edgewise and in its turn similarly receives a third tube and so on, the whole series of tubes being mutually interlocked, substantially as and for the purposes described.

2. A structural arrangement consisting of a series of longitudinally slotted and mutually interlocked tubes in combination with a hard setting material charged thereinto, substantially as and for the purpose as hereinbefore described.

3. A structural arrangement consisting of a plurality of longitudinally slotted and mutually interlocked tubes, 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.