C. C. DENNETT.

CONSTRUCTION OF CONCRETE ARCHES FOR BUILDINGS, &c.

No. 98,571. Patented Jan. 4, 1870.

Fig. 4.

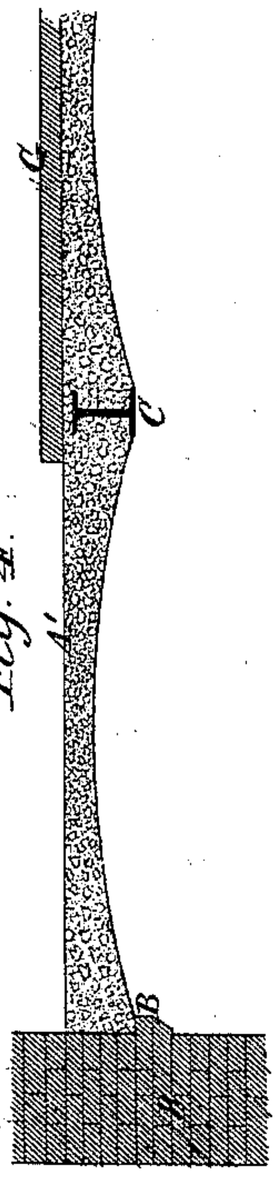


Fig. 5.

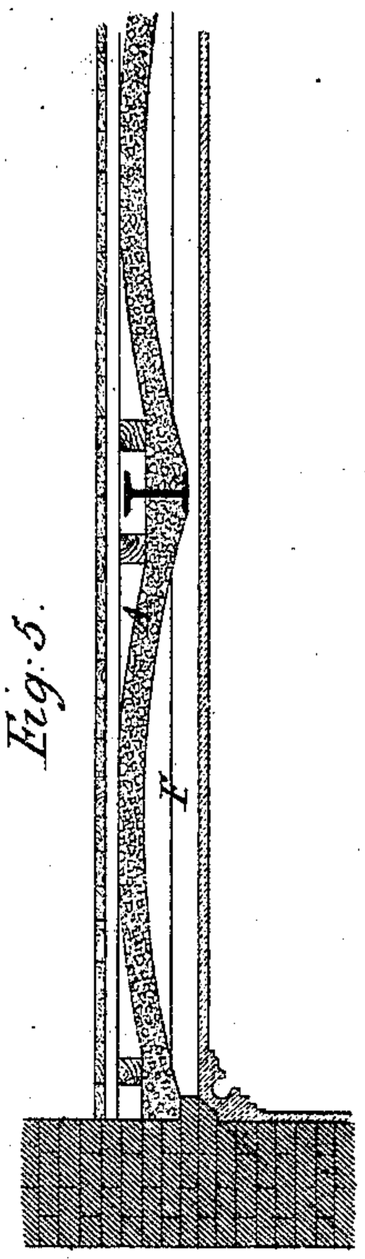
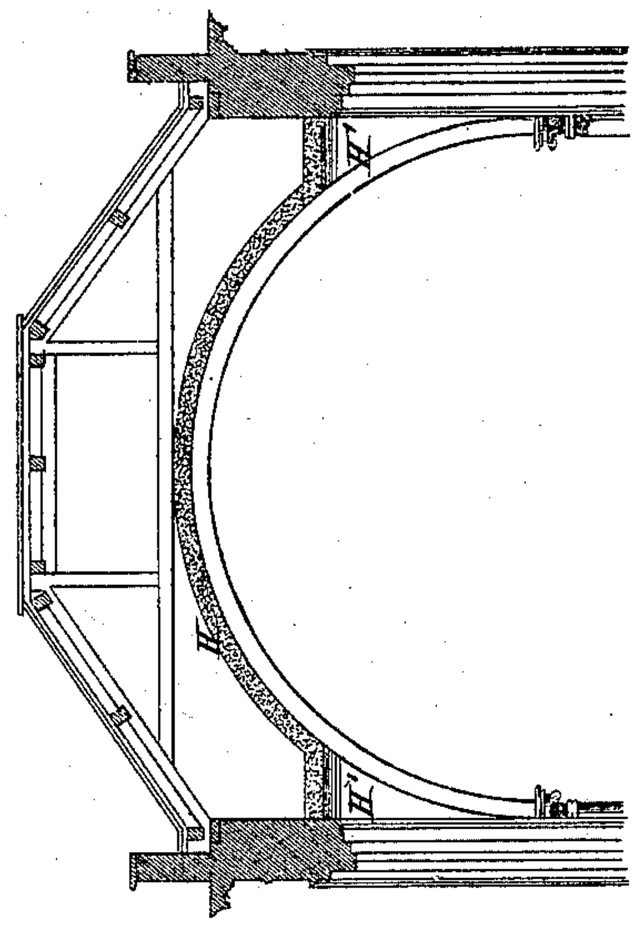


Fig. 6



Witnesses
R. C. Dennistoun
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Charles Colton Dennett
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Fig. 1.

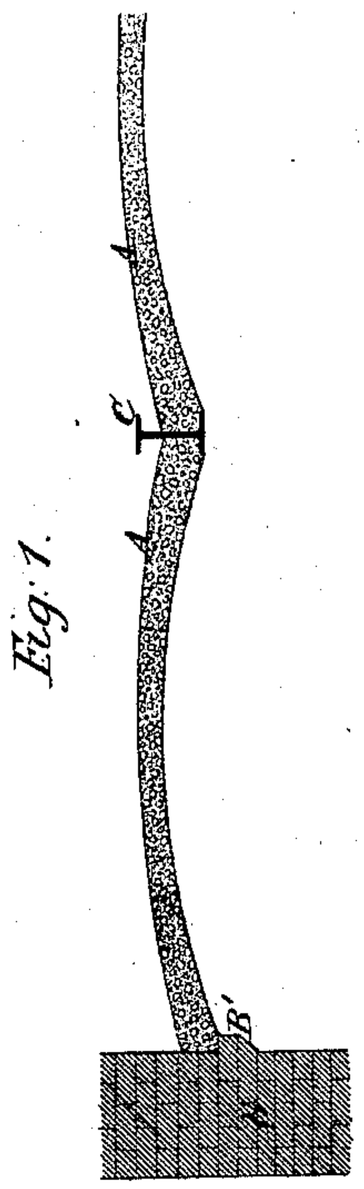


Fig. 2

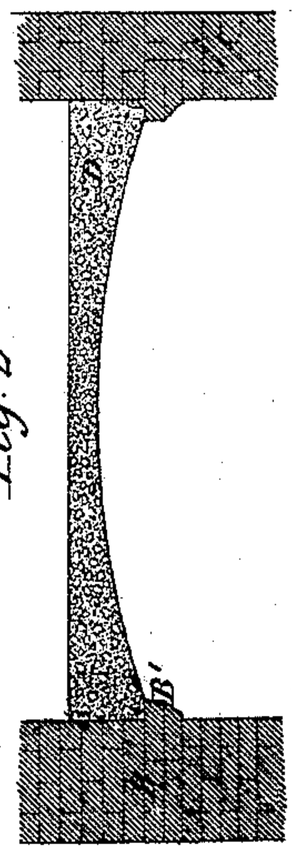
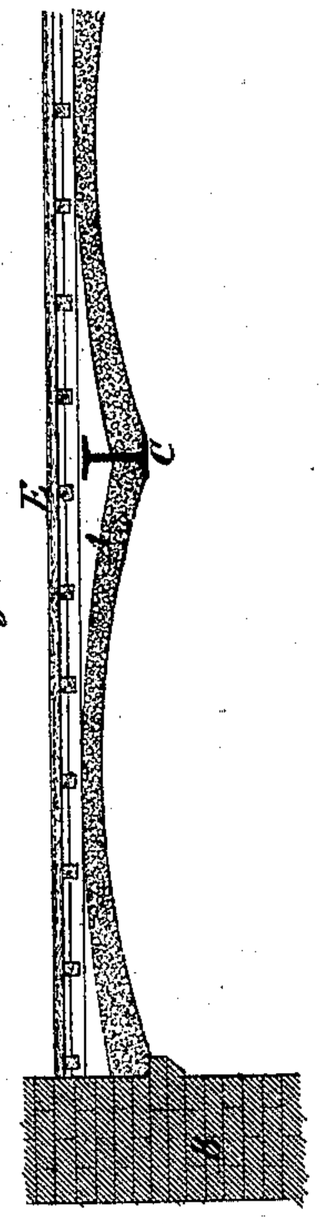


Fig. 3.



United States Patent Office.

CHARLES COLTON DENNETT, OF NOTTINGHAM, ENGLAND.

Letters Patent No. 98,571, *dated January* 4, 1870; *patented in England, August* 13, 1863.

IMPROVEMENT IN THE CONSTRUCTION OF CONCRETE ARCHES FOR BUILDINGS, &c.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, CHARLES COLTON DENNETT, of Nottingham, in the county of Nottingham, England, builder, have invented an "Improved Construction of Concrete Arches for Buildings and other structures;" and I do hereby declare that the following is a full and exact description of the said invention, reference being had to the accompanying sheet of drawings, and to the figures and letters marked thereon; that is to say—

My invention consists in the application to buildings, of arches formed of concrete, composed of sulphate or carbonate of lime, together with broken calcined cinders, bricks, or other similar suitable materials, such arches being employed without any additional support, such as has been used heretofore with ordinary concrete arches.

The concrete produced by the above materials, possessing great strength, and being capable of resisting, effectually, the action of extreme heat, such concrete arches may be employed for floors, ceilings, shelves, benches, &c., either in cottages, churches, music-halls, or large public buildings, as well as private houses, mills, warehouses, factories, malt-rooms, or any other kind of building; and they will be found to be of the greatest use in forming fire-proof ceilings, either plain or ornamental, as they can be turned in any shape of groin, dome-circle, or wagon-head, and to any length, width, or height, formed with raised or sunk panels, at pleasure, or left smooth for painting and decorating.

They are also adaptable for floors of mills, warehouses, factories, malt-rooms, or any other kind of building, and can either be finished, as for cottages, with polished face, or left rough, and finished with brick, tile, wood, or stone floors laid on same, the under side being finished either in an arched shape, or as a flat ceiling.

This material may also be used with economy in forming dormer or lantern-lights, as it can be used for the sides as well as top, and has the advantage of being in one solid piece; and for any sort of skew or arches over recesses, this invention will be found to be applied more readily than brick arches, and quite equal in strength.

For ventilating-purposes, these arches are particularly adapted, as either pipes can be inserted, or flues formed in the material in any direction. Also as a cheap, sound-proof construction, either for floors or partitions, this material can be used with great advantage.

On the accompanying sheet of drawings are shown some of the various modes in which my improved concrete arches may be applied.

The arch-form is that which is usually adopted for the construction of floors, as shown at A, fig. 1, the spandrels of same being, however, in some cases, filled in with the material, so as to form a horizontal floor, (A', Figure 1.)

These arches, when thoroughly set, exert no thrust upon the outer walls, and, in fact, from their slight rise and thoroughly homogeneous character, they possess as much the nature of a beam, or landing, as that of an arch. For this reason, their use is, in many cases, advantageous where that of brick arches would be altogether inadmissible.

The arches are supported, at the points where they abut upon the walls B, by projecting courses of brick-work, B', and at intermediate points by rolled-iron joints, or riveted girders, C. They have a minimum rise in the soffits, of one inch to every foot of width, and they are turned in this proportion up to spans of ten or twelve feet.

Corridors and cottage-floors are formed in this manner, without the introduction of any joist or beam whatever, as shown at D, Figure 2.

The soffits of the arches, after removal of the centres, simply require to be finished with the last, or setting-coat of ordinary plastering. In cellars, and other basement-offices, no other coat whatever is necessary.

Where a wood floor is indispensable, the boards are laid upon light sleeper-joists, as shown at E, Figure 3, or stone or tile paving may be applied, as at G, Figure 4. If a flat ceiling is required, ceiling-joists are fixed to the lower flanges of the iron girders, and lathed and plastered in the ordinary manner, as at Figure 5. It is generally preferred, however, in buildings of a public character, such as banks, offices, &c., to leave exposed the lower flanges of the iron girders. This is the most constructional mode of treatment; and by the judicious application of colored decoration, a very effective ceiling is obtained.

Figure 6 shows the application of the invention to the forming of an arched or vaulted ceiling, H, with groins, H', at the windows.

The formation of vaults or domes, particularly those of an ornamental character, is one of the most advantageous applications of the concrete. As no expense is involved in the cutting of groins, coffer-ribs, &c., it is in itself less costly than brick or stone, besides saving considerable expense in the strength of the outer walls, which would be necessary to withstand the lateral thrust of ordinary vaulting. It is, moreover, better adapted for decorative treatment, either in color or relief.

My invention derives much of its utility from the fact that by it I am enabled to utilize such materials as those described, which, resulting from the destruction of buildings, or surplus or wastage in

manufacture, have heretofore been thrown away as of little or no value. By mixing them, as described, with phosphate or carbonate of lime, I utilize a large amount of otherwise waste material.

Having thus described the nature of my invention, and in what manner the same is to be performed,

What I claim, and desire to be secured to me by Letters Patent, is—

Constructing self-supporting arches, for buildings and other structures, of concrete, composed of sulphate or carbonate of lime, together with broken bricks, calcined cinder, or other similar suitable material, substantially as set forth.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses, this 16th day of August, 1869.

CHARLES COLTON DENNETT.

Witnesses:

H. KREISMANN,

JAMES A. MCMURTRIE.