A. ENGLAND.

CONSTRUCTION OF CHIMNEYS, TOWERS, AND OTHER HOLLOW STRUCTURES.

APPLICATION FILED FEB. 10, 1913.

1,188,919.

Patented June 27, 1916.

2 SHEETS—SHEET 1.

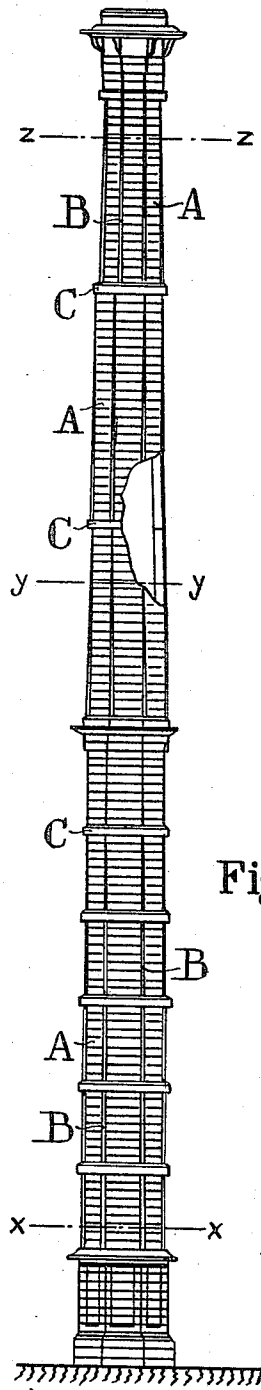


Fig. 1.

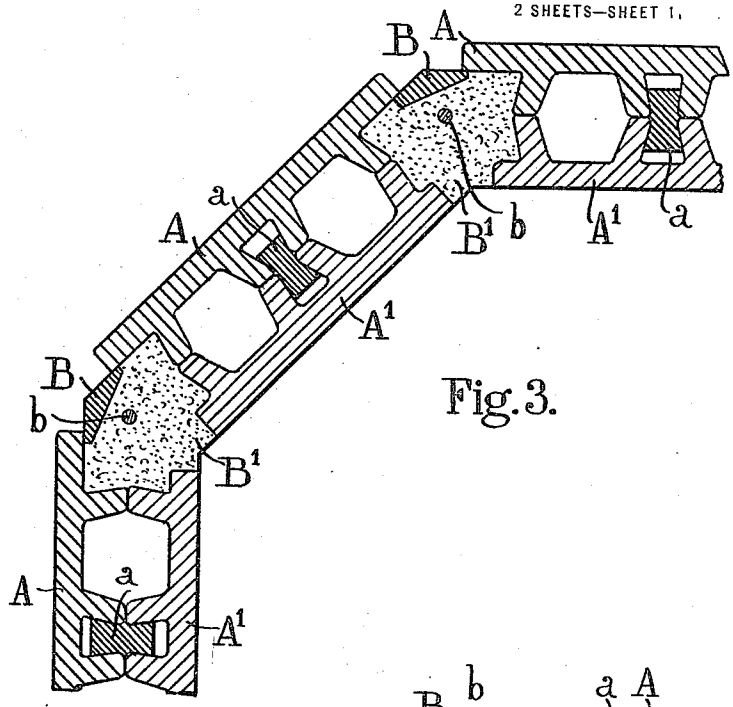


Fig. 3.

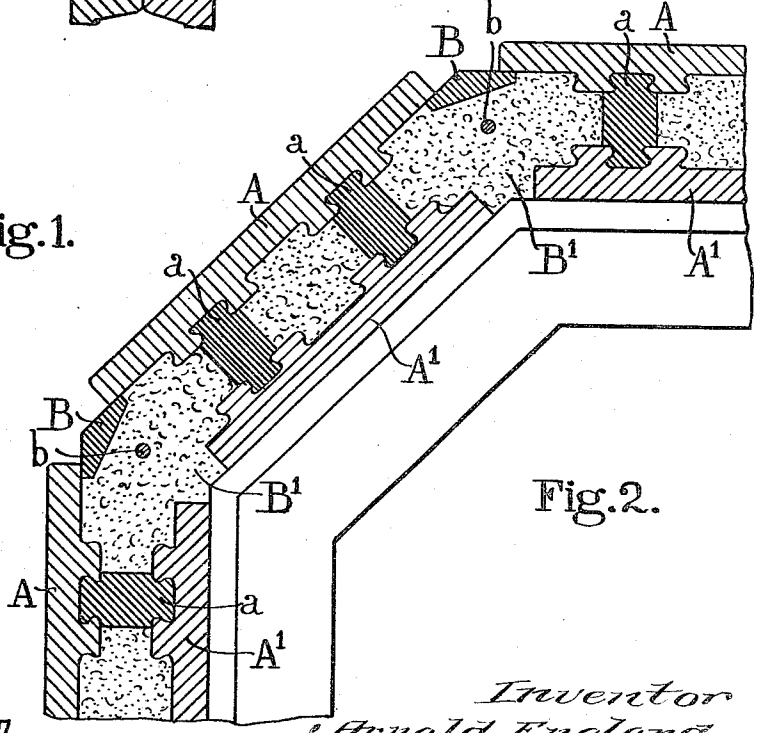


Fig. 2.

WITNESSES.

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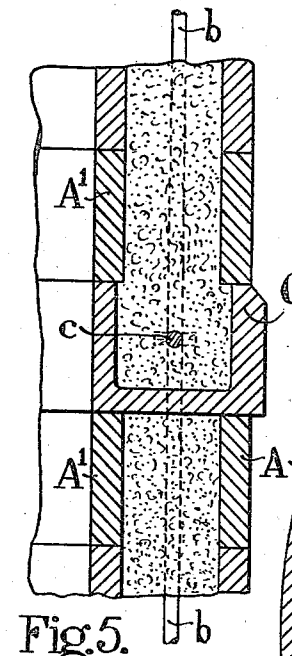


Fig. 5.

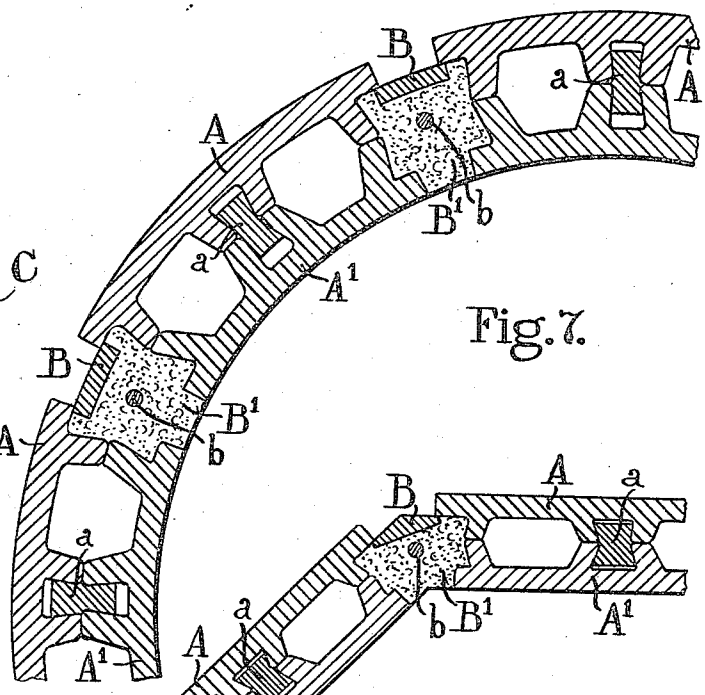


Fig. 7.

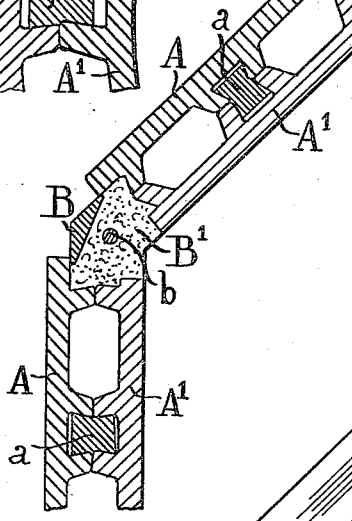


Fig. 4.

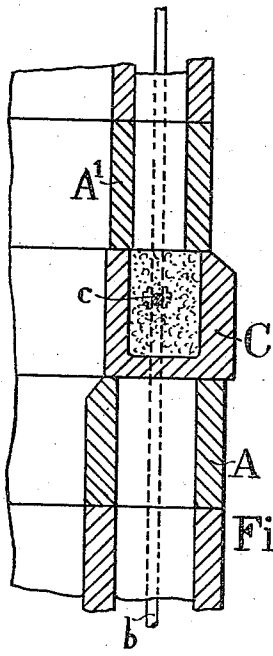


Fig. 6.

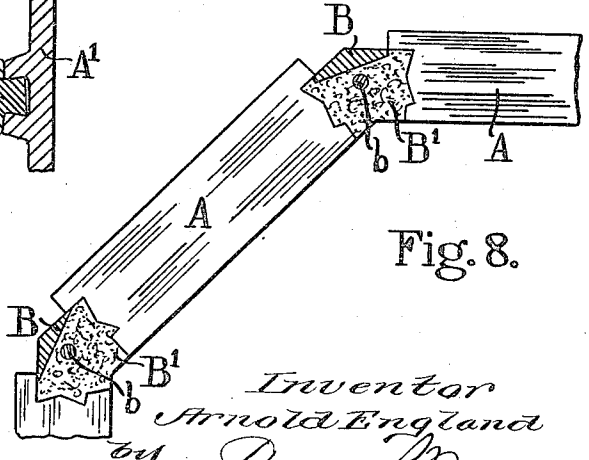


Fig. 8.

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ARNOLD ENGLAND, OF ST. ANNES-ON-SEA, ENGLAND.

CONSTRUCTION OF CHIMNEYS, TOWERS, AND OTHER HOLLOW STRUCTURES.

1,188,919. Specification of Letters Patent. Patented June 27, 1916.

Application filed February 10, 1913. Serial No. 747,442.

To all whom it may concern:

Be it known that I, ARNOLD ENGLAND, a British subject, residing at St. Annes-on-Sea, county of Lancaster, England, have invented certain new and useful Improvements in the Construction of Chimneys, Towers, and other Hollow Structures, of which the following is a specification.

This invention relates to a method of building hollow structures such as high chimneys and towers.

The invention consists essentially in building the chimney (or other hollow structure) with six, eight or other number of sides, from a number of rows or courses of slabs, with loose flat junction pieces between the ends of the blocks to allow of blocks of uniform size being employed to build a tapering chimney or similar structure.

It will be described with reference to the accompanying drawings.

Figure 1 is a side elevation of an octagonal chimney partly in section. Fig. 2 is an enlarged section on line *x*—*x* Fig. 1. Fig. 3 is an enlarged section on line *y*—*y* Fig. 1. Fig. 4 is an enlarged section on line *z*—*z* Fig. 1. Fig. 5 is an enlarged vertical section through one of the trough shaped members in the lower part of the chimney. Fig. 6 is an enlarged section through another of the trough shaped members in the upper part of the chimney without concrete between the slabs. Fig. 7 is a section of a circular chimney. Fig. 8 is a section showing solid blocks in lieu of hollow blocks.

The chimney (or other structure) is composed of courses of slabs or blocks, A, A′ the blocks or slabs being preferably constructed with strengthening ribs on one side and a flat or finished face on the other.

In constructing a chimney or other hollow structure, the slabs or blocks A A′ are set back to back in courses some distance apart and keyed together by the key blocks *a*. The slabs of each course are brought closer together than those of the next lower course, to give a gradual taper to the chimney, the slabs slightly overlapping at their inner edges. The spaces at the corners or between the ends of adjacent slabs are filled with vertical columns of concrete B′, and the spaces between the slabs in the lower courses, say for the first ten courses more or less, are filled in solid with concrete, as shown in Fig. 2.

Between the ends of the blocks A at the corners or angles of an octagonal chimney or structure, and at even distances around a circular chimney or structure, flat loose junction pieces B of triangular, rectangular or lenticular in cross section are inserted toward the exterior, as shown, and if desired, toward the interior also, to retain the vertical filling B of concrete in position and give a finish to the outside of the chimney or other structure. The ends of the slabs or blocks A overlap the loose junction pieces B more or less, according to the taper of the chimney or other structure, the said loose junction pieces forming on the exterior and interior elevation long narrow vertical sunk panels triangular in section, thereby enabling a chimney or structure to be erected of considerable height with blocks or slabs of one even length.

In the filling of concrete or cement B′ at the ends of the blocks A and at the angles of the structure, upright reinforcing ties, rods or bars *b* of metal are inserted. At intervals in the height of the chimney (or other structure) a course of a number of trough shaped members C is inserted. These trough shaped members C are inserted at intervals of every ten courses (more or less) for part of or throughout the full height of the chimney (or other structure).

The trough shaped members C are open at the ends, which latter are cut off square, or are shaped to correspond with the preceding course of slabs A, and when in position the trough shaped members C are filled with concrete. Transverse ties, rods or bars *c* are passed from the upright corner reinforcing tie rods *b*, horizontally through the members C and are embedded in the concrete therein. The open ends of the said members permit of the concrete at the cor-

ners forming a solid column from bottom to top of the chimney (or other structure), with the reinforcing members *b* also extending from top to bottom.

After the first ten or twenty courses, according to the size and weight of the structure, the slabs A may be only keyed together as shown in Figs. 3 and 4, and the corners filled in solid with concrete, as each course of slabs A is placed in position, the loose junction pieces B being built in at the same time. Each succeeding course of trough shaped members C is braced together with horizontal reinforcing ties *c* and filled with concrete or cement, thereby forming a chimney or other structure faced both inside and outside with stone like slabs, with solid columns of cement extending from bottom to top at every corner or junction, and with transverse rings or belts of concrete reinforced with horizontal ties at intervals in the height of the structure.

The junction pieces B may be of a length equal to the depth of one block A, or of two or more of such blocks, and may be so laid as to break joint therewith. Junction pieces similar to those used for the outside may if desired be used also at the interior between the ends of the blocks A, so that the vertical columns of reinforced concrete or cement will be entirely surrounded by blocks or slabs.

The blocks A forming the courses between one pair of courses of trough shaped members, are preferably smaller than those forming the courses between the previous pair of trough shaped members, to obtain a gradual taper of the chimney, (see Figs. 2, 3, and 4). Solid blocks in lieu of two blocks keyed together may be used with the junction pieces B and concrete B′ to form the vertical columns as before described, (as in Fig. 8.) Ornamental slabs or blocks may if desired be built into the structure, and a coping built on to the top. The structure may be built either tapering or straight as required.

What I claim as my invention and desire to protect by Letters Patent is:—

1. In a polygonal chimney stack or tower, the combination with superposed, horizontal courses formed of blocks, of loose, flat junction pieces inserted within the confronting ends of the blocks of each course, the flat junction pieces in each course being disposed directly above those in the next lower course, whereby the superimposed junction pieces unite in forming long narrow, sunken vertical panels in the finished construction.

2. A polygonal chimney stack or tower composed of superposed, horizontal courses formed of blocks, loose, flat triangular junction pieces inserted within the confronting ends of the blocks of each course, the junction pieces in each course being disposed directly above those in the next lower course, whereby the superposed junction pieces unite in forming long narrow, sunken vertical panels in the finished construction, and a filling of cementitious material disposed between the said confronting ends of the blocks and behind the adjacent flat triangular junction pieces, to back said panels and maintain them in position.

3. A polygonal chimney stack or tower composed of superposed, horizontal courses formed of spaced, inner and outer layers of blocks, loose, flat triangular junction pieces inserted within the confronting ends of the blocks which form the sides of each course in the spaces between said layers, the triangular junction pieces in each course being disposed directly above those in the next lower course, whereby the superposed flat triangular junction pieces unite in forming narrow, sunken vertical panels in the finished construction, and a filling of cementitious material disposed in the spaces between the said outer and inner layers of blocks at the confronting ends of the latter and behind the adjacent junction pieces, to back said panels and maintain them in position.

4. In a polygonal chimney stack or tower composed of superposed, horizontal courses formed of spaced, inner and outer layers of blocks having their inner faces provided with oppositely located pairs of spaced, vertical ribs, and key blocks fitted at their ends in the spaces between the ribs of opposite pairs, to connect the corresponding blocks of said inner and outer layers, the combination of loose flat junction pieces inserted within the confronting ends of the blocks of each course in the spaces between said layers, the flat junction pieces in each course being disposed directly above those in the next lower course, whereby the superposed junction pieces unite in forming narrow, sunken vertical panels in the finished construction.

5. In a polygonal chimney stack or tower composed of superposed, horizontal courses formed of spaced, inner and outer layers of blocks having their inner faces provided with oppositely located pairs of spaced, vertical ribs, and key blocks fitted at their ends in the spaces between the ribs of opposite pairs, to connect the corresponding blocks of said inner and outer layers, the combination of loose, flat triangular junction pieces inserted within the confronting ends of the blocks of each course in the spaces between said layers, the flat triangular junction pieces in each course being disposed directly above those in the next lower course, whereby the superposed junction pieces unite in forming narrow, sunken vertical panels in

the finished construction, and a filling of cementitious material disposed in the spaces between the said outer and inner layers of blocks at the confronting ends of the latter and behind the adjacent junction pieces to back said panels and maintain them permanently in position.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ARNOLD ENGLAND.

Witnesses:
GEO. H. O'BRIEN,
HARRY BARNFATHER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."