I. B. HILL.

ARCHITECTURAL TERRA COTTA CONSTRUCTION.

APPLICATION FILED JULY 7, 1914.

1,134,741. **Patented Apr. 6, 1915.**

Fig: 1.

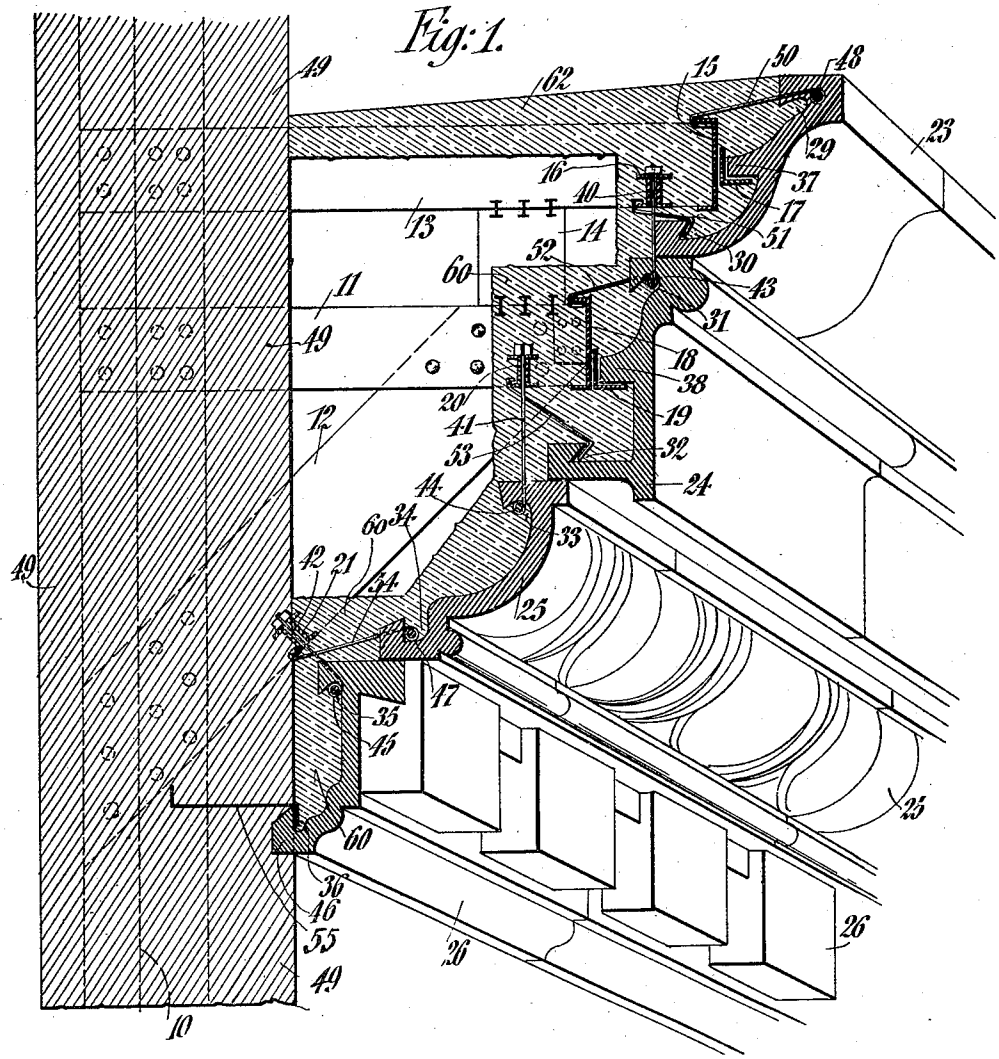


Fig: 2.

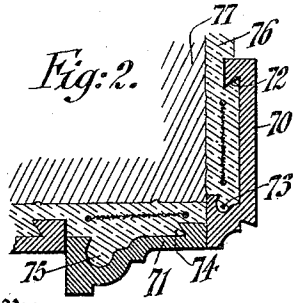


Fig: 3.

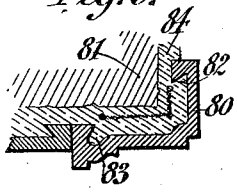
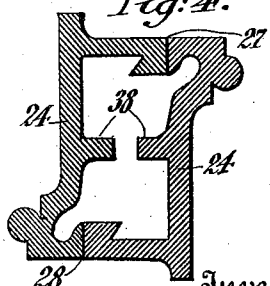


Fig: 4.



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ARCHITECTURAL TERRA-COTTA CONSTRUCTION.

1,134,741. Specification of Letters Patent. Patented Apr. 6, 1915.

Application filed July 7, 1914. Serial No. 849,436.

To all whom it may concern:

Be it known that I, ISAAC B. HILL, a citizen of the United States of America, residing in Plainfield, county of Union, and State of New Jersey, have invented certain new and useful Improvements in Architectural Terra-Cotta Construction, of which the following is a sepcification.

This invention consists of an improvement in plastic facing materials for the walls, partitions and ceilings of buildings where brick or concrete, or both together are used as the backing or filling portions of the structure. The facing materials to which the invention applies are architectural terracotta, artificial stone and concrete blocks,—with special reference to architectural terracotta.

The object of the present invention is to furnish a new terracotta construction for the cornices, trimmings, around openings, wall facings, corners, and other exposed and projecting portions of buildings, by means of which the individual terracotta facings are securely held.

The invention comprises the combination, with the wall of the building, of a terracotta facing-plate having a reëntrant recess at or near each of two opposite edges thereof, and a filling of concrete in said recesses and between the back of the plate and the building wall, whereby the facing is retained in place, the concrete filling adhering to the wall of the building.

While undercut and dovetail recesses are an old and common mechanical device employed in the improvement of the structural form of many different materials, what is claimed as new in this invention is a radical change in the structural forms of the material known as architectural terracotta, in the extensive range of superficial forms and dimensions pertaining to that material as distinguished from all other kinds of burnt clay products. As stated above, there are in this invention two reëntrant recesses on each piece located at or near each of two opposite sides or edges of same. This is the case with every piece of architectural terracotta which is so formed as to possess the two edges to which the reëntrant recesses may be applied, and at the same time regardless of the size of the piece or of its relation to the wall structure into which it is built. The edges on which the reëntrant recesses are used are at the exposed wall face of the piece, thus disposing of all deep bonds in the wall structure in each and every case. By the use of these reëntrant recesses, it becomes possible to dispense with all the usual end, side and partition shell material heretofore considered essential to the forms and sizes of architectural terracotta units. These shell elements have heretofore been required for maintaining the form and trueness of the units throughout the entire process of manufacture and to provide a bond in the wall structure.

This invention provides for all these contingencies in maintaining the hollow terracotta form during the manufacturing processes by means of the complex-piece method, also by the introduction of an intermediate back rib under certain circumstances, all as hereinafter more fully described. In completing the invention it has also been necessary to provide for practicability as to setting the material. The accompanying drawings have been made to illustrate in sufficient variety and detail how this is accomplished. Figures 2 and 3 are simple forms, having little projection beyond the wall face. In Fig. 1, the cornice, all courses project, so that it is necessary to provide special means for supporting same during erection. This is accomplished by the use of the various iron or steel members and elements shown on the drawing and as more fully described hereinafter. By means of these metal members the terracotta is set and secured in place without any other methods or appliances than those ordinarily employed. After the terracotta is set, it is filled from behind with reinforced concrete, the metal members mentioned forming the substantial part of the support and the reinforcement. This metal construction is shown to indicate the practicability of the use of the terracotta forms included in this invention as applied to the ordinary building construction. The invention comprises, therefore, the new and improved forms of architectural terracotta units as described and their combination with usual and ordinary metal, concrete and masonry construction in a monolithic form.

In the accompanying drawing, Fig. 1 is a vertical section, partly in perspective, of a cornice embodying the invention, Fig. 2 is a horizontal section, showing the corner of a building wall or jamb with the facing-plate applied thereto, Fig. 3 shows another form of terracotta corner facing-plate, and Fig. 4

shows the condition in which the terracotta facing-plates are found after manufacture and before application to the cornice.

Similar characters of reference indicate corresponding parts throughout the several figures.

Referring to the drawing, the steel column 10 carries an outwardly-projecting arm 11, which is supported at its outer end by a brace 12. An upper arm 13 is also provided and supported at its inner end by attachment to the column 10 and near its outer end by a vertical supporting piece 14. A plurality of such columns, with their outwardly-extending arms, is located along the building to be provided with the cornice. Between the arms and braces of the successive columns extend horizontal cornice-supporting irons, which may be of various shapes and locations. Such supporting irons are shown at 15, 16, 17, 18, 19, 20, 21. They are fastened at their ends to the arms 11, 13 and braces 12 in any suitable manner usual in iron-work construction. These structural members are well known.

In the structure shown in Fig. 1, four forms of terracotta facing-plates are employed, respectively 23, 24, 25 and 26. The form in which these terracotta facing-plates are manufactured, as, for instance, plate 24, is illustrated in Fig. 4. A complex blank is constructed comprising a tubular block whose shell wall forms a plurality of ornamental exterior facings, as for instance 24 and 24, and whose interior has longitudinal lugs uniting said facings. These lugs are provided with lines of fracture 27 and 28 whereby upon severance said tubular blank is adapted to provide a plurality of said facing plates, and each of said facing plates has an ornamental facing at its front and a plurality of reëntrant angles on its rear. In Fig. 4 the complex blank is duplex and forms two facing plates only. This complex blank construction provides a most economical method for holding each facing plate to its true form throughout the manufacturing process. If each piece were to be made independently it would be absolutely necessary to join the backs of the two reentrant sockets on each plate by temporary terracotta material until the piece was completely burned. This temporary material would then be cut away and wasted. This waste is saved by the complex piece method as described.

By ornamental, I mean either actually ornamented, as shown in the middle part of Fig. 1, or capable of being ornamented, as for instance, any plain surface which may be provided with decorative projections, or simply plainly faced which by itself acts to ornament, as for instance, the plain surface of the upper row of facing plates shown in Fig. 1.

It is to be noted that each of the seven units shown in Figs. 1, 2 and 3 is so arranged or designed in profile that by reversing two units of each kind in their relation to each other and placing them back to back as in Fig. 4, they will exactly and conveniently fit each other as to the two pieces 24 in the figure shown.

In the facing-plate 23 a reëntrant socket is shown at 29, a lower reëntrant socket is found at 30. In the facing-plate 24 the upper reëntrant socket is shown at 31, and the lower socket at 32. In the facing-plate 25 the upper socket is shown at 33, and the lower at 34. In the facing-plate 26 the upper socket is located at 35, and the lower at 36. The facing-plates are also provided with supporting ribs projecting inwardly therefrom, about midway between the sockets or recesses. Such a rib is shown at 37 on the facing-plate 23, and a similar rib at 38 on the facing-plate 24. The angular horizontal supporting irons 17 and 19 respectively serve to support the facing-plates by engaging the ribs. For further supporting the facing-plates, hangers 40, 41 and 42 are provided, which pass through the horizontal supporting irons 16, 20 and 21 respectively, and are provided at their outer ends with nuts. Said hangers extend through the joints of the terracotta, and are engaged at their inner ends with socket-rods 43, 44, 45 which extend longitudinally in the reëntrant sockets of the successive terracotta facing-plates, and thereby afford a secure means whereby the hangers are engaged with the terracotta facing-plates. The sockets of the facing-plates being reëntrant as shown, the socket-rods are prevented from escaping, and the tightening of the nuts on the hangers only serves to more firmly secure the terracotta facing-plates in position. Hooks 50, 51, 52, 53, 54 are also employed, the outer ends of these hooks being hooked over the flanges of the horizontal supporting irons in the manner shown, and the inner ends of the hooks engaging the terracotta at the lower reëntrant socket or engaging a socket-rod therein, as shown for instance at 47 in Fig. 1. The upper hook 50 may be engaged with a longitudinal bar 48 in the terracotta.

By the hangers and hooks, the facing-plates are supported superposed, as shown in Fig. 1. The lower edge of the lowermost facing-plate may be inserted in the building wall 49, as shown at 46, and thereby the lower edge of the facing-plate secured, as shown, by the wall anchor, 55. After the facing-plates have been placed in the position described, a filling of concrete 60 is placed at the back of the same, completely filling the reëntrant sockets in the terracotta facing-plates, also extending rearwardly to such extent as to completely inclose the horizontal supporting irons and the hangers and

hooks, as indicated in Fig. 1. At its lower part the cornice is also retained by the adhesion of the filling 60 to the building wall 49, and at the top a roof 62 of concrete is extended from the uppermost facing-plate 23 rearwardly to join the building wall. When the concrete has set the facing-plates are found rigidly secured in place with the concrete and the whole reliably supported by the horizontal supporting irons, forming a monolithic feature of the building on which it is erected.

For the vertical corners of building walls, facing-plates 70, 71 (Fig. 2) may be employed, said facing-plates meeting conveniently at their outer faces, and the facing-plate 70 being provided with the reëntrant sockets 72, 73, and the facing-plate 71 with the reëntrant sockets 74, 75, whereby, when the reinforced concrete filling 76 is introduced between the wall 77 and the facing-plates 70, 71, the facing-plates are firmly secured to the wall.

In Fig. 3 is another corner facing-plate, extending in this case in both directions from the corner of the wall. Said facing-plate 80 is provided opposite one face of the wall 81 with the reëntrant socket 82, and opposite the other face of the wall with the reëntrant socket 83, whereby, when the reinforced concrete filling 84 is inserted, the facing-plate is secured fast to the wall.

Whenever it is necessary to provide an iron support for any of these terracotta facing-plates to rest upon, there will be a longitudinal rib in the middle of the back of the plate running parallel with the two edges on which the reëntrant recesses occur. The iron support will then be placed under this rib which will thus support the facing-plate. The terracotta members thus formed of a facing-plate with reëntrant recesses or sockets on two opposite edges, and with an intermediate rib or iron support when required, dispense with all other end, side and partition portions of the terracotta facing-plates as usually employed.

It is evident that the shape of each facing-plate will be determined by the profile of the face and that, therefore, there can be no single predetermined form for all facing-plates or for the section of the reëntrant recesses and ribs.

The usual solid ends and cross partitions are omitted. Bed-joints are made only of sufficient depth in the wall to provide the necessary hold for pointing mortar, or to form the proper section of shell for completing the brace or clamp bond which is an essential feature of the invention. This brace bond is produced by making two opposite edges of the terracotta shall turn toward each other like the ends of the letter "C," so that when the space thus inclosed in the terracotta shell, together with the wall space immediately behind the terracotta, are filled with reinforced concrete, or grout, the terracotta will have a hold or grip on the solidified wall like that of a pair of jaws, that being the general form of the terracotta section. By the "edges of the terracotta" are meant the boundary lines of the units at the exposed wall face of the material, it being the purpose of this invention in the interest of economy and an improved monolithic construction to dispense with all the hollow shell bonding material usually employed, using only the "jaws" or reentrant recesses on the backs of the facing plates. As the two ends of the piece are open, the concrete or grout filling and backing will be continuous from piece to piece in the same line or course. The backing material, which is an extension of the filling inclosed by the terracotta shell, will occupy the wall space immediately behind the terracotta, being carried around the back edges of the beds from one course into the next adjoining courses above and below. This entire combination of the brace or clamp form of terracotta shell with the concrete or grout filling and backing, when properly anchored and tied to the main structure, results in the whole being braced or bound together into a practical monolith.

In the nature of the case there can be no one fixed form of shell section for all pieces on account of the great variety in the forms of the pieces themselves. Each piece will have its own form of shell which will be determined by the form of its exterior profile, the requirement above mentioned for the proper brace or clamp bond, and the requirement for so forming the backs of the reëntrant recesses as to fit properly with its companion unit in the double-piece arrangement above described. These various provisions for manufacturing architectural terracotta in all the great variety of superficial forms and dimensions pertaining to that material comprise the new forms and processes which are the basis of this invention as far as the material itself is concerned.

To produce terracotta in this form will require changed methods in manufacturing processes. New opportunities will be afforded for the adoption of mechanical devices to replace hand-work, thus rendering it possible to produce the material more economically and of a more even texture. This possibility is due to the omission of the solid ends and partitions.

Instead of the pieces or blocks being pressed from and turned out of the molds on their backs in the customary manner, the facing-plates made in accordance with this invention will require the work generally to be made in double molds,—two pieces attached back to back. Also there will be a

hollow center like a flue extending down through the entire length of the double piece in the space where the solid ends and cross partitions, formerly used, are omitted. After burning, the double pieces will be cut apart on the dividing line where their backs are joined, as described.

To allow for the loss of stiffening support due to the omission of the ends and partitions, it will be necessary to increase the thickness of the shell to some extent, proportioning the thickness to the sizes of the pieces. But the double-piece form itself will to a great extent compensate for the omissions.

The advantages claimed, therefore, for this invention are the same facing effects as under present methods, produced with a greatly reduced weight or quantity of material; the strongest possible wall bond,—a practical monolith; more economical manufacturing processes, producing at the same time a better texture of material; a standardized form of construction which is based upon a definitely fixed rule for making the bond of each course or section.

By the means of support described, cornices and other projecting structures may be built extending outwardly from the building wall to a considerable width, with entire security. Cracking of the terracotta by frost is obviated by the complete seal which the reinforced concrete backing or filling affords. Said backing serves also to retain the hangers and hooks in place, engaged with the reëntrant sockets of the terracotta.

I have described several embodiments of the invention, but it is obvious that changes may be made therein without departing from the spirit of the invention as set forth in the appended claims.

I claim:

1. A complex blank of terra cotta for architectural variformed terra cotta construction comprising a hollow block whose shell wall forms ornamental exterior facings and whose interior has longitudinal lugs uniting said facings, said lugs being provided respectively with lines of fracture whereby upon severance said blank is adapted to provide a plurality of facing plates, each having an ornamental facing at its front and a plurality of reëntrant angles on its rear.

2. A complex blank of terra cotta for architectural variformed terra cotta construction, comprising a hollow block having opposite ornamental exterior facings, interior central lugs projecting from opposite side walls, oppositely inclined interior lugs disposed adjacent to diagonally opposite corners forming reëntrant angles, said blank being adapted on severance through said inclined lugs to form a plurality of terra cotta facing plates, each having two reëntrant recesses and a central stay on its rear.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

ISAAC B. HILL.

Witnesses:
C. P. GOEPEL,
F. HOGG.

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