Jan. 14, 1936. C. F. GEIGER ET AL 2,027,585

KILN SETTER FOR REARING OF TABLEWARE

Filed Nov. 9, 1934

Fig. 1.

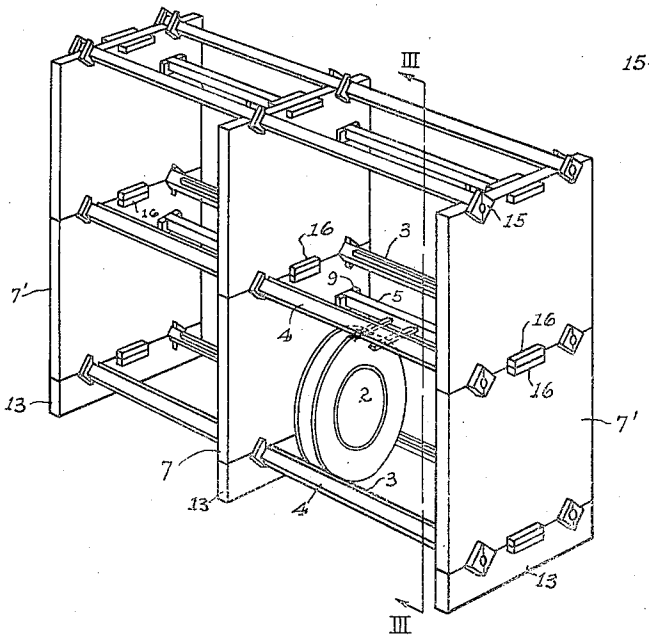


Fig. 8.

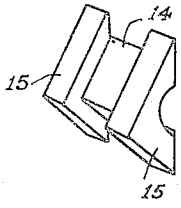


Fig. 4.

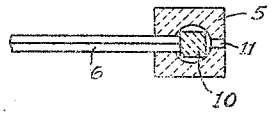
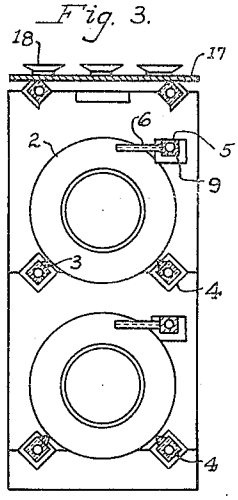


Fig. 3.



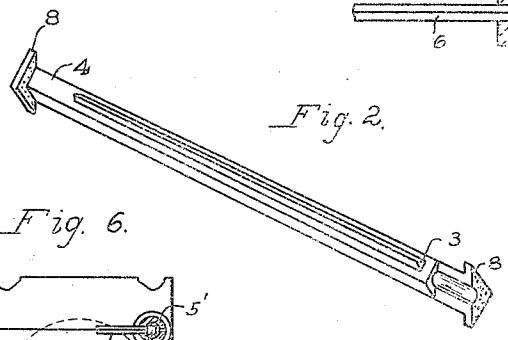


Fig. 2.

Fig. 6.

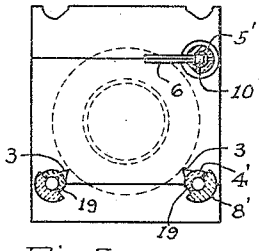


Fig. 5.

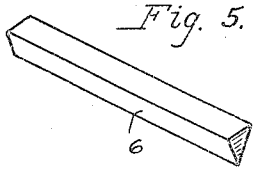


Fig. 7.

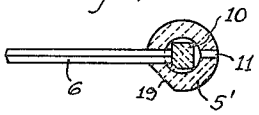
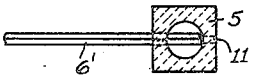


Fig. 9.



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KILN SETTER FOR REARING OF TABLEWARE

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Application November 9, 1934, Serial No. 752,336

6 Claims. (Cl. 25—153)

This invention relates to an improvement in kiln setters intended for the support of table ware or similar ceramic ware during the process of glost firing, that is during the fixation of the glaze coating.

One of the principal objects of the invention is to provide a light weight refractory setter unit or section which can be combined with similar units so that the assembly may be extended indefinitely in length and also extended in height within reasonable limits. In the case of a straight tunnel kiln the assembly of setter units is mounted on trucks. In the case of a circular tunnel kiln, setter units are assembled in groups on a rotatable table or platform.

It is desirable that the setter units or sections should be provided with terminal connections and supports so that the first unit which is placed may be extended horizontally to form a basic group and that this group should be extended vertically by the superposition of one or more groups on the basic group. It is also desirable that the construction of each section or unit should be such that the ware to be glazed can be inserted or removed without dismantling the setter assembly or any of its sections.

To avoid marring the appearance of the ware the contact areas should be small and should occur on such parts of the ceramic objects that the resulting scars shall be as inconspicuous as possible. Small contact pieces can be made (for insertion in large supporting members) of a highly refractory material and may have the form of wedge-shaped members adapted to support the weight of a ceramic article which contacts with two edges on respective wedge-shaped members. Point contacts can be used for the lateral support of the ceramic ware. The supporting members in this last case may be called pins. The refractory edges and points of these supporting bodies are liable to become blunted by reason of adhering ceramic material. It is desirable therefore that the wedge-shaped members and pins should be capable of easy insertion and removal.

The means by which these various advantages are obtained in accordance with the present invention are illustrated by means of the accompanying drawing in which:

Figure 1 is a perspective view of four sections of the setter, each section being designed to support a number of plates in approximately vertical position;

Figure 2 is a perspective view of one of the longitudinal tie pieces shown in Figure 1;

Figure 3 is a vertical section showing a plurality of the longitudinal tie pieces and taken in a plane indicated by III—III of Figure 1, but showing in addition a cover on which small ceramic objects can be placed;

Figure 4 is a transverse section of one of the elements of Figures 1 and 3;

Figure 5 is a view of one of the pins;

Figure 6 is a vertical section of a setter unit illustrating a modified form of tie piece;

Figure 7 is an enlarged view of a detail of Figure 6;

Figure 8 is a detail view illustrating a modified locking means employed where one of the plates which supports this tie piece is used as an end wall; and Figure 9 is a view similar to Figure 4 except that the filler post in the cylindrical opening is omitted.

Referring to the drawing in detail, a ceramic object 2 (such as a plate) is supported on its lower edge by means of replaceable wedge-shaped members 3 which are held while in use in slots in tie pieces 4. Another member 5 extends between two vertical walls 7 and 7' and carries a pin 6 which serves for the lateral support of the plate 2 by means of a point contact on the back of the plate and near its upper edge.

Tie pieces of the type indicated by the reference character 4 are supported by means of walls which may be partition walls 7 or end walls 7'. In the construction illustrated by means of Figures 1, 2, and 3 each of the tie pieces is square or rectangular in cross-section. The terminal portions of the tie pieces 4 are cut away on planes diagonal to the tie piece. The terminal portions of two oppositely extending tie pieces fit into each other within a partition wall. Projections 8 are provided on the ends of the tie pieces 4. These projections contact with the faces of the walls 7 or 7' and serve to prevent movement of the walls away from the tie pieces.

The tie pieces 4 just described are made hollow by providing for example a cylindrical air space which extends longitudinally through each tie piece. Lightness of construction is thus combined with mechanical strength.

The members 5 are supported at their ends in pockets 9 provided on the surfaces of the walls between which they extend. These members 5 are also made hollow and are provided with recesses into which the terminal portions of the pins 6 are inserted. Bars 10 (see Figure 4) are inserted within the hollow members 5 to limit the inward movement of the pins 6. After a

run in which ceramic ware has been glazed and after the removal of the ware the members 5 are lifted out and turned over to permit the pins 6 to fall out. If the pins stick the bar 10 is removed and a tool is inserted through the opening 11 to knock out any pin 6 which has stuck to its support.

It should be noted that the member 5 in a given setter unit is not equidistant from the lower tie pieces 4. The member 5 is placed closer to the rear tie piece (of the two tie pieces 4 in the lower portion of the section) so that plates can be easily inserted or removed from the front side of the given section. On each of the trucks (used to transport the setter assembly through a straight tunnel kiln) sections are placed in pairs back to back so that ware can be easily inserted or removed from either side of the truck.

In the case where straight tunnel kilns are employed for glazing the ware the assembly of an interconnected group of setter units on one side of a truck is performed by first placing all the lower units of a group on suitable base members such as those indicated by the reference number 13 in Figure 1. Four tie pieces 4 extend between the terminal walls of each section and pass through said walls, the lateral projections 8 serving to interlock the tie pieces with the walls 7 or 7'. In the case of the end walls 7' a short supplementary locking member 14 is shown. This supplementary member is shaped to fit snugly against the terminal cut away portion of a tie piece 4. The lateral projections 15 contact with respective opposite sides of an end wall 7'. After the lowest row of a group of setter units has been placed in position, a second row of setter units is similarly placed on top of the first row, the weight of the second row serving to hold the first row still more firmly in interconnected relation. The upper pair of tie pieces 4 (used to hold any unit of the lowest row) serve also as tie pieces for the second row of setter units. The number of tie pieces used for the assembly is thus kept comparatively small in number. A third row of setter units can be placed on top of the second row and other rows may be added as desired within the limits permitted by the height of the kiln and by the mechanical properties of the refractory material from which the setter units are made.

The wall sections 7 and 7' are provided with ledges 16 which increase the area of contact between the walls belonging respectively to a lower section and to an upper section. These ledges 16 increase the rigidity of the assembly without adding appreciably to the weight.

The number of units or sections which are connected together longitudinally in a given group will depend in practice on whether a straight tunnel kiln is used or whether a circular tunnel kiln is used, the possible number of interconnected units being greater in the former case. In the latter case, where a circular tunnel kiln is used, the assembly of setter units is made on a rotatable platform. The units are connected in groups whose length will depend on the curvature of the circular tunnel, that is on the mean radius of the platform on which the setter units are to be mounted.

In Figure 3 a cover 17 is shown for an assembly of setter units. This cover is in the form of a light refractory plate which can be used for the support of small ceramic objects 18 during the glazing process.

In the modification shown in Figures 6 and 7 tie pieces 4' having a general cylindrical shape are shown. These tie pieces are provided with semicylindrical lateral projections 8' which are used in a manner similar to the projections 8 described above. The tie pieces 4' are also provided with flat surfaces 19 which prevent rotation of these tie pieces within the supporting walls.

The tie pieces 4 or 4' and the pin carriers 5 or 5' can be made of any suitable refractory material. The projections 3 and the pins 6 (which come into contact with the ware being glazed) are made of a somewhat harder refractory material which will not stick appreciably to the ceramic ware, such material being similar to that ordinarily used in the manufacture of contact pieces for table ware which is subjected to glost firing.

The setter unit described in detail above has many advantages such as a low ratio of weight of setter structure to the weight of the ware which is supported. The same walls may be used at different distances by employing various lengths of tie pieces. The ends of the tie pieces are well adapted for quickly joining a number of units end to end in sufficiently rigid relationship.

By limiting the number of units or sections which are joined end to end in a given series, the setter units can be assembled in a plurality of groups on a rotating table or platform of a circular tunnel kiln.

An assembly of setter units of the type indicated in Figure 1 can be used for rearing a series of plates of different sizes, the upper units having the tie pieces differently spaced as compared with the lower units. The assembly is shown in Figure 3 as provided with a cover which is used to support small ceramic articles such as cups, saucers, etc.

While a number of modifications may be made in the construction of our kiln setter and in the materials used in such construction, the invention is defined by means of the following claims.

We claim:

1. A setter unit forming a skeleton structure for the rearing of ceramic ware in glost firing, said unit comprising two vertically disposed walls, two tie pieces extending between said walls and carrying projecting edges for supporting ceramic ware, a third member extending between said walls above said tie pieces and carrying a plurality of pins for the lateral support of said ceramic ware, and means on one or more of the tie pieces for interlocking said walls with said tie pieces and holding the setter unit together.

2. A setter unit forming a skeleton structure for the rearing of table ware in glost firing, said unit comprising vertically disposed end walls, a plurality of horizontally disposed members terminally supported by said walls and carrying projecting edges for supporting the main portion of the weight of the ware to be glazed, another horizontally disposed member extending between said walls and carrying a plurality of pins for the lateral support of said ware, one or more of said horizontally disposed members being cut away adjacent each end for insertion through a hole in each of said walls and for engagement with means locking the

ends of the horizontally disposed member to the respective walls.

3. A setter assembly forming a skeleton structure for the rearing of table ware in glost firing, said structure comprising a series of vertically disposed walls spaced apart to form a series of compartments for holding ware, horizontally disposed members extending between said walls for supporting table ware by means of edge or point contacts, said horizontally disposed members being each cut away at one or both ends so that corresponding members in consecutive compartments fit together in openings in the wall to form continuous tie pieces for a plurality of walls, and locking projections extending laterally from said reduced ends to interlock the walls with the tie pieces.

4. A light weight setter assembly for rearing table ware in glost firing, said assembly comprising a plurality of vertically disposed thin refractory plates adapted for building up supporting walls in successive steps, a plurality of horizontally disposed tie pieces arranged in a plurality of horizontally disposed series in which each member of a given series ties together two wall elements by means of oppositely disposed lateral projections which contact with the outer surfaces of the wall elements so connected, the terminal portion of a tie piece being cut away where it passes through a wall opening of approximately the same transverse dimensions as a tie piece so that the said tie piece interfits with an oppositely extending tie piece, wedge-shaped members projecting from said tie pieces and furnishing refractory edges for supporting the weight of ceramic objects, and a plurality of refractory pins for furnishing lateral point support to said ceramic ware, said pins being loosely supported in horizontally disposed members which have terminal support in pockets provided in consecutive wall elements.

5. The setter unit described in claim 1 in which the member carrying the pins is individually removable and in which the pins are loosely mounted in holes in said member so that the pins can be dropped out by the rotation of said member when removed.

6. The setter assembly described in claim 4 in which the members carrying the pins are removably supported by projections on the walls from which they can be lifted for turning the pins downwardly so that they fall from their supports.

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