Nov. 1, 1932. P. D'H. DRESSLER 1,885,691

WARE SUPPORT

Filed April 24, 1928

Fig. 1,

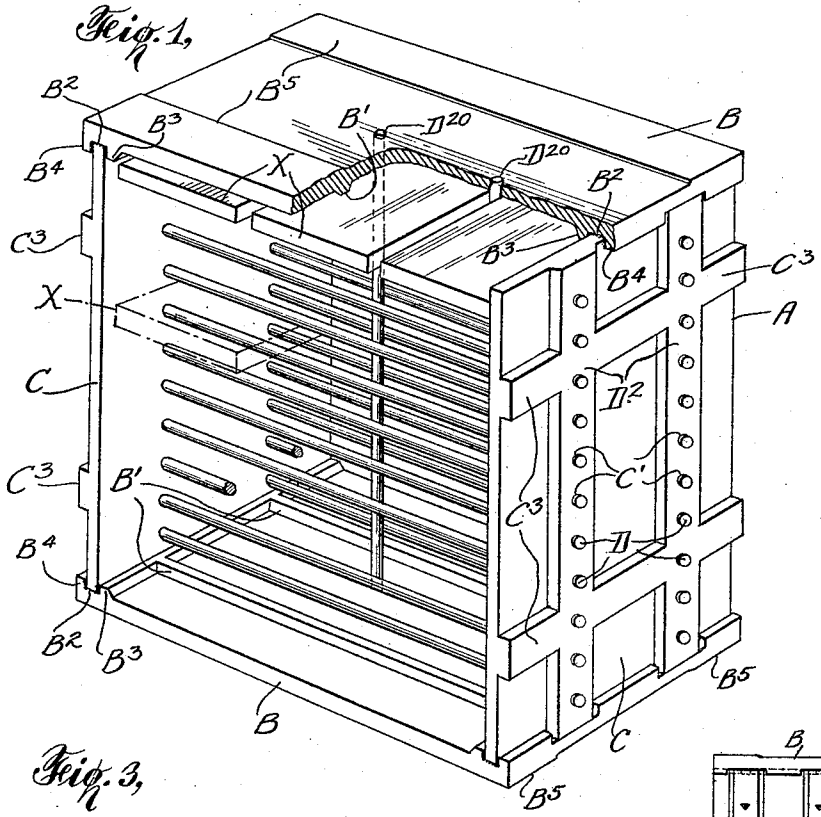


Fig. 2,

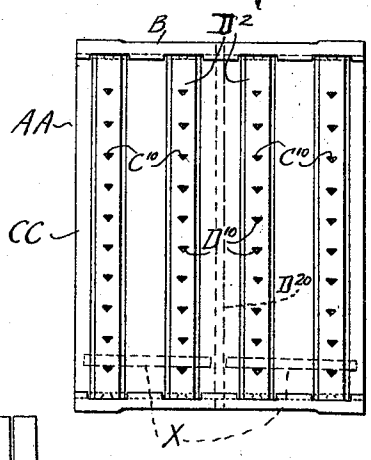


Fig. 3,

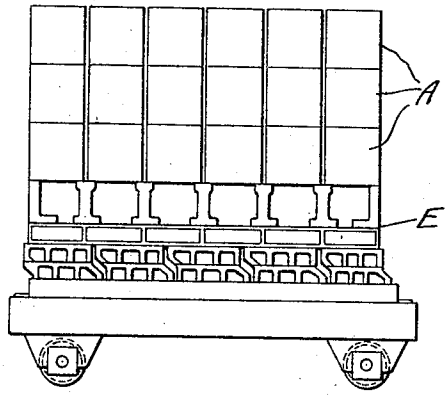
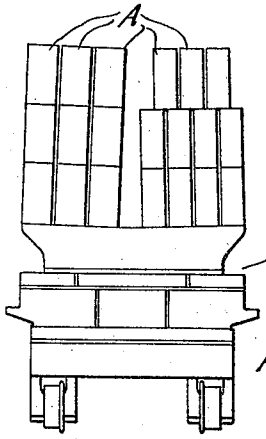


Fig. 4,



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UNITED STATES PATENT OFFICE

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WARE SUPPORT

Application filed April 24, 1928. Serial No. 272,422.

The general object of the present invention is to provide improved means for supporting ware, and particularly ceramic ware, while the ware is being fired in kilns and during ware handling and transporting operations incidental to its firing.

My improved ware support comprises a box-like body which may be described as an open ended tube of refractory material and rectangular in cross section, and which is characterized by features of construction and arrangement including supporting provisions for a plurality of spaced apart pieces of ware whereby the ware support is given the necessary strength and rigidity to permit it to be lifted and bodily transported when filled with ware, and to permit a plurality of such ware supports to be stacked up one above another to a suitable height on the kiln car of a tunnel kiln, or on the floor of an intermittent kiln, while at the same time the weight of each ware support and its ware supporting provisions are kept small as compared with the weight of ware fired therein, and the weight of the support and its contents may be kept small enough to permit of the ware support with its contents being readily lifted and handled by a person possessing no more strength than is possessed by the girls commonly employed to insert ware pieces in, and remove them from the saggars in which ceramic ware is ordinarily fired.

The various features of novelty which characterize my invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, however, and the advantages possessed by it, reference should be had to the accompanying drawing and descriptive matter in which I have illustrated and described a preferred embodiment of the invention.

Of the drawing:

Fig. 1 is a perspective view with parts broken away and in section, of a preferred form of ware support partially loaded with ware;

Fig. 2 is a side elevation of a modified form of ware support;

Fig. 3 is a diagrammatic side elevation of the body portion of a tunnel kiln car loaded with ware held in the improved ware supports; and

Fig. 4 is an end elevation of the apparatus shown in Fig. 3.

The improved ware support A, shown in Fig. 1, comprises top and bottom walls B, B, and an opposed pair of side walls C, C. The latter are shown as pierced with openings C′ to receive the ends of ware supporting rods or bars D. As shown in Fig. 1, the opening C′ and rods D are circular in cross section, though they may be polygonal in cross section as are those shown in Fig. 2 so the rods may be partially rotated between successive firing operations if and when this becomes necessary or desirable because of the sagging or bending of the rods. As shown in Fig. 1, there are two vertical rows of openings C′ in each ware support side C, and two corresponding rows of rods D, which are shown as spaced and arranged to support a multiplicity of superposed spaced apart ware pieces. As shown, the ware consists of flat slabs or tiles X, and each pair of rods D at the same level supports three side by side tiles X, each of which is of a length but a trifle less than the width of each side member C. In addition, the bottom wall member B of the support is shown as formed with two ribs B′ parallel to the rods D and located one beneath each row of rods. These ribs form supports for a lower ware piece or layer of ware pieces. Preferably, in order to provide ample strength and bearing support for the ends of the rods D with a minimum of ware support weight, each side member C is provided with two vertical ribs D^2, so disposed that each row of holes C′ extends through one of the ribs D^2.

With the ware support construction shown in Fig. 1, the two sides C, C, and the top and bottom members B, B, each consists of a slab or plate of ceramic material, the two sides C, C, being counterparts of the other, and the top and bottom members B, B, also being counterparts of one another. As shown, each part B is formed with a recess or groove B^2 at each side edge to receive the adjacent edge or portions of the adjacent

edge of the corresponding side member C, the side walls of each groove B^2 being formed by inner and outer projections or ribs B^3 and B^4, respectively, on the body portion of the corresponding member B. When the slabs forming the walls B and C as shown in Fig. 1 are assembled, they are cemented together by any suitable cement such as one formed of a mixture of clay and silicate of soda, or one formed of glaze material. When this cement sets and hardens, the structure comprising the side parts C, C, and top and bottom parts B, B, forms a rigid unit having sufficient mechanical strength to permit each such unit with its ware contents to be lifted and transported manually, or on a conveyor belt or transfer table during the operations incidental to the use of the ware support in successive firing operations. Furthermore, such relatively light-weight ware supports A possess sufficient mechanical strength and rigidity to permit them to be stacked up to any usual or suitable height in an intermittent kiln or on the ware supporting platform E of a tunnel kiln car as shown in Figs. 3 and 4.

To facilitate the stacking of the ware supports A, notwithstanding the presence of sand or the like on the top of a support of platform on which another ware support is to be mounted, the top and bottom pieces B may be formed with suitably disposed low external ribs or projections B^5. Advantageously also the parts C are provided with external horizontal ribs C^3 providing convenient hand holds and making it easier to lift the assembled and loaded units.

The described construction of the ware support A out of separately formed flat parts B and C of ceramic material with mortised and cemented joints between the parts, possesses a number of special advantages. For one thing, the different parts B and C may be readily and economically formed in a press with such ribs and depressions as are required or desirable to insure the necessary strength with a minimum of weight, and with a desirable accuracy facilitating the assembly of the wall parts and insuring proper alignment of each opening C′ in one side wall C with the corresponding opening C′ in the opposite side wall. Furthermore, this method of construction permits of the transportation of the ware supports in a knocked-down condition from the place of manufacturing to the place of use. Transportation of the ware supports in their knocked-down condition obviously reduces freight charges and breakage loss in transportation. The simplicity of the construction and the mortise joints facilitates an accurate assemblage of the individual ware supports at the place of use.

The improved ware supports are obviously adapted for use in firing any articles of ceramic ware which can be readily inserted in, and removed from the ware support and which are fired under conditions in which it is not necessary to prevent contact of the kiln atmosphere with the ware. The improved ware supports were especially devised and are of especial value, however, for use in firing flat tiles. Heretofore, it has been the usual practice in firing such tiles, to support them in superposed separated layers by means of a stack of so called cranks or supporting devices in the form of slabs, each of which is recessed at its underside to receive a tile, or tiles, supported on a subjacent crank on the ware supporting platform at the bottom of the stack. With such crank supports, the weight of the tiles fired is appreciably less than the weight of the tile supports. With the present invention the weight of the tiles fired may be 50% or so greater than the weight of the ware supports. The increase in the ratio of tile weight to tile support weight, thus made possible amounts to nearly 100% in ordinary practice. Since in the firing operation the supporting means must be heated up as well as the ware, the relative reduction in weight of the ware supporting means gives a substantial practical increase in capacity of a given kiln burning a given amount of fuel in a given time.

In order to keep the weight of each ware support and its load small enough to permit of the ready manipulation of the ware supports in filling and emptying the latter preparatory to and at the end of each firing operation, a ware support A intended for use in firing ordinary flat wall tiles, may advantageously be proportioned, as shown, to have the width of its sides C but a trifle greater than the length of a single tile X. Where conditions make it desirable, however, to place the tiles or other articles end to end in the support, the latter may be formed with a plurality of pairs of rows of openings C^{10} and bar rods D^{10}, as shown in Fig. 2. Vertical rods D^{20} may be inserted in openings in the top and bottom walls for limiting the movement of the tiles during the loading operation. With the end to end arrangement shown in Fig. 2, a pair of such rods D^{20} are placed between the adjacent ends of each pair of end to end tiles. These rods may be either permanent or removable. If removable, the rods are preferably taken out when the loading operation is completed to prevent any possibility of the ware being damaged by contact with melting glaze on the rods.

Another advantageous feature of the present construction is that if the amount of glaze evaporated during the firing operation and collecting on the surfaces above the tile becomes so great that there is danger of it dripping on the tile, the ware support can be turned upside down for the next firing operations without changing the capacity or varying the effectiveness of the support because

of the similarity in construction of the top and bottom slabs.

While in accordance with the provisions of the statutes, I have illustrated and described the best form of the embodiment of my invention now known to me, it will be apparent to those skilled in the art that changes may be made in the form of the apparatus disclosed without departing from the spirit of my invention as set forth in the appended claims, and that in some cases certain features of my invention may be used to advantage without a corresponding use of other features.

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

1. A light weight support for firing ceramic tile consisting of an open ended tube of refractory material which is rectangular in vertical cross section and is formed with vertical rows of openings in opposed side walls, each such opening in one side wall being in alignment with a corresponding opening in the opposed side wall, the remaining walls of said tube being similarly formed to permit either to serve as the supporting base for said support when the latter forms one of a stack of such supports, tile supporting bars extending across the interior of said support and each having its ends received in a corresponding pair of aligned openings in the opposed side walls, said holes being similarly spaced relative to said remaining walls whereby said support has the same tile capacity when either of said remaining walls is uppermost.

2. A ware support for ceramic firing in the form of an open ended box-like body, the top, bottom and side walls of which are each formed of a separate slab of ceramic material, said slabs being formed with cooperating tongue and groove portions providing a mortise joint between each side member and each of the top and bottom members.

3. A ware support for ceramic firing in the form of an open ended box-like body, the top, bottom and side walls of which are each formed of a separate slab of ceramic material, said slabs being formed with cooperating tongue and groove portions providing a mortise joint between each side member and each of the top and bottom members, and said members being cemented together at said joints.

4. A ware support for ceramic firing consisting of an open ended box-like body of refractory material formed with vertical rows of openings in opposed side walls, each such opening in one side wall being in alignment with a corresponding opening in the opposed side wall, said side walls being thickened adjacent said openings to elongate, and give added strength adjacent said openings, and ware supporting bars extending across the interior of said support and each having its ends received in a corresponding pair of aligned openings in the opposed walls.

5. A ware support for ceramic firing in the form of an open ended box, the top, bottom and side walls of which are each formed of a separate slab of ceramic material, said slabs being formed with cooperating tongue and groove portions providing a mortise joint between each side member and each of the top and bottom members, and said side members having spaced apart vertical reinforcing rib-like projections and being formed with openings for ware supporting bars which extend through said projections.

6. A ware support for ceramic firing in the form of an open ended box-like body, the top, bottom and side walls of which are each formed of a separate slab of ceramic material, said slabs being formed with cooperating tongue and groove portions providing a mortise joint between each side member and each of the top and bottom members, said top and bottom members being similar to one another and being each formed with an external rib at its opposite sides.

7. A ware supporting unit adapted for manual and mechanical handling and to be stacked up with similar units one on top of another in a firing kiln and consisting of an open ended box-like body formed of slabs of ceramic material jointed and cemented together and formed with external reinforcing ribs and formed with openings in its opposed walls and ware supporting bars having their ends received in said openings and extending across the interior of said body, whereby said unit may be made strong enough for its intended service, and light enough for manual handling, and the weight of said body and bars may be kept relatively low in comparison with the weight of spaced apart material to be fired mounted on the said bars of the unit.

8. A ware support for ceramic firing in the form of an open ended box-like body, the top, bottom and side walls of which are each formed of a separate slab of ceramic material, said slabs being formed with cooperating tongue and groove portions providing a mortise joint between each side member and each of the top and bottom members, said members being cemented together at said joints, and the side wall slabs being provided with transversely extending external projections adapted to serve as hand holds in lifting said support.

9. A ware support for ceramic firing in the form of an open ended box-like body of refractory material formed with vertical rows of openings in opposed side walls, each said opening in one side wall being in alignment with a corresponding opening in the opposed side wall, ware supporting bars extending across the interior of said support and each having its ends received in a corresponding

pair of aligned openings in the opposed walls, and one or more vertical rods extending transversely of said supporting bars for limiting the movement of ware on said bars.

10. A ware support for ceramic firing in the form of an open ended box-like body, the top, bottom and side walls of which are each formed of a separate slab of ceramic material, said slabs being formed with cooperating tongue and groove portions providing a mortise joint between each side member and each of the top and bottom members, and ware supporting means carried by said side walls and extending across the interior of said support.

Signed at Cleveland, in the county of Cuyahoga and State of Ohio, this 20th day of April, A. D. 1928.

PHILIP D'HUC DRESSLER.