June 26, 1928. 1,674,836

G. D. MORRIS

TUNNEL KILN CAR AND METHOD OF LOADING WARE THEREON

Filed June 22, 1927

Fig. 1,

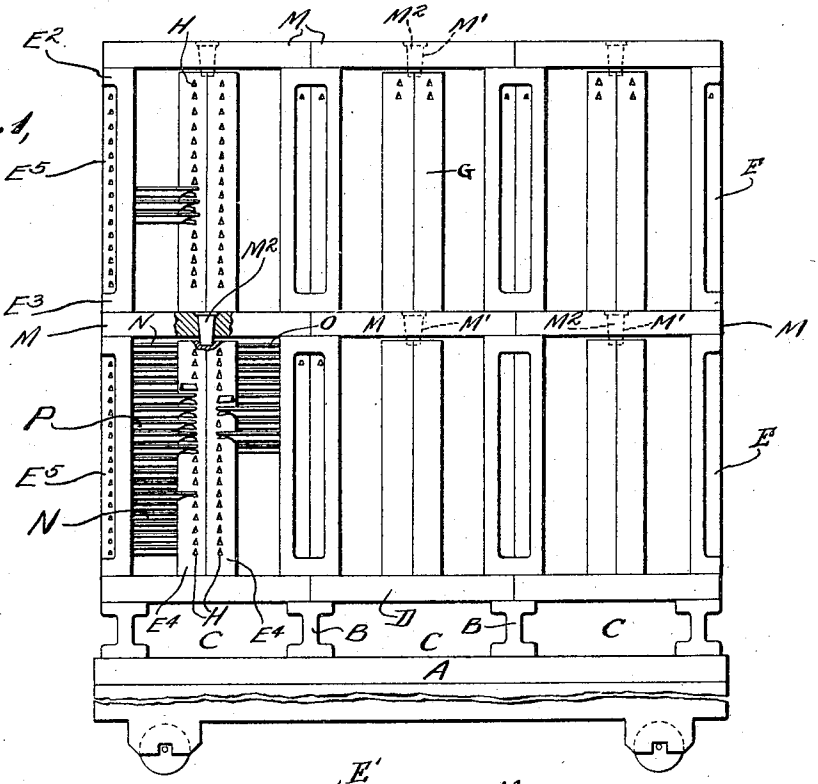


Fig. 2,

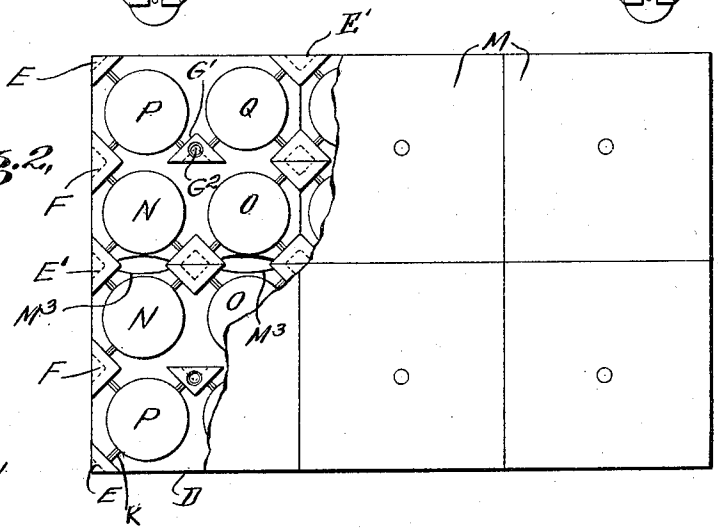
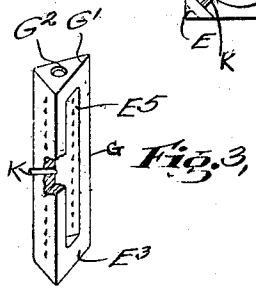


Fig. 3,



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UNITED STATES PATENT OFFICE.

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TUNNEL-KILN CAR AND METHOD OF LOADING WARE THEREON.

Application filed June 22, 1927. Serial No. 200,539.

The present invention relates to a ware supporting deck construction for kiln cars arranged to move through a tunnel kiln in which the ware is subjected to firing operations, and the object of my invention is to provide improved means for supporting ceramic ware during the passage through the kiln and which may be mounted upon and form a permanent structure upon the trucks or cars used in the tunnel kiln. Another object is to provide a novel method of loading ware on the ware supporting structure.

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 drawings and descriptive matter in which I have illustrated and described a preferred embodiment of the invention.

Of the drawings;

Fig. 1 is a side elevation of the body portion of a ware supporting car with my improved supporting structure mounted thereon;

Fig. 2 is a plan view of the structure shown in Fig. 1 with portions of the top deck broken away; and

Fig. 3 is a perspective view of the removable post of my invention.

In the construction illustrated in Figs. 1 and 2, A represents the refractory body portion of a truck or car such as is commonly employed in continuous tunnel kilns. At the top of the body portion of the car are mounted transverse beams B which form supports for the load upon the car and are spaced away from one another to provide channels C extending transversely to the length of the car. Supported on adjacent transverse beams are a plurality of flat refractory slabs D forming the lower deck of the ware supporting superstructure. In the construction shown six of these slabs are used to form the deck. Supported on each slab D and suitably spaced from each other are a plurality of ware supporting posts comprising corner posts E and E′ intermediate side post F and a central removable post G.

Each of the posts E′ and F consists of a vertical refractory body of general triangular shape comprising solid top and bottom portions E^2 and E^3, respectively, connected by two integral side portions E^4 so arranged that a vertically extending recess E^5 is formed by the backs of the side portions in the remaining side of the post. The solid side portions E^4 are arranged to face inwardly from the sides of the car and are provided with a vertically spaced series of triangular shaped slots H extending through and inclined from the inner to the recessed outer side of the post. The slots H are adapted to receive triangular shaped pins K projecting inwardly from the inner side of the post and on which plates or other flat ware are supported for glost or other firing operations. The slots H are tapered at their outer ends to hold the pins in position with a predetermined portion projecting from the face of the post as shown in Fig. 3. The corner posts E are of slightly different construction from the posts E′ and F in that the rear side only is provided with pin slots and the other sides are cut away at one end as shown in Fig. 2.

The central post G is of slightly less height than the other posts and has its top portion G′ provided with a central recess G^2. Otherwise the post G is of the same construction as the posts E′ and F.

A plurality of flat slabs M of the same shape and size as the slabs D are supported on the corner and side posts E, E′ and F to provide an upper deck for the car. In the center of each slab M is arranged an opening M′ through which a movable pin M^2 projects and fits into the recess G^2 of the central post G. The inner side of the slabs M are arranged with cut away portions M^3 as shown in Fig. 2 to provide passages for the circulation of the kiln atmosphere. The slabs D are constructed with similar passages.

For the contemplated use in my invention, the corner and side posts are first positioned on the lower deck slabs D of the car with the pins K inserted in position in the posts. The top slabs M are then placed in position on the posts to form the remaining part of the permanent superstructure. The innermost bungs of plates N and O or similar ware are inserted in position on the pins mounted on the inner corner and intermedi-

ate side posts E′ and F respectively. The central post G is then mounted in position on the slab with its recess G^2 in alignment with opening M′ in the upper slab. The pin M^2 is inserted in the opening and engages in the recess of the post to hold the post in position. The outer bungs of plates P and Q are then placed in position on the pins mounted in the remaining posts. The remaining portions of the car are loaded in a similar manner with the rear bungs being placed in position first, the removable post G inserted and the outer bungs then placed in position. As shown in Fig. 2, some of the posts will assist in supporting adjacent slabs of the upper back and also have their rear portions contacting with the rear sides of the corresponding posts supporting other sections of the upper slab structure. With the construction described, the circulating passages formed in the slabs and between the supporting posts of the deck structure permit the kiln chamber atmosphere to be circulated through and around the ware being heat treated. It is obvious that after the permanent part of the superstructure has been once placed in position, that only the posts G will be moved during subsequent loading and unloading operations.

My invention is especially useful in the firing of table ware, as the cars can be loaded without the necessity of transporting heavy ware containing saggers such as are normally used in such operations. This permits of the use of relatively cheap female labor in loading the cars. The formation of the kiln car with a permanent superstructure eliminates the use of saggers which are often broken in the loading operations with resulting damage to the ware contained therein. It has been found in practical operation that more ware can be loaded in a given space on the car with the present structure than was possible with any of the former deck constructions in use.

While in accordance with the provisions of the statutes, I have illustrated and described the best form of 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. In a kiln car, a ware supporting superstructure comprising a permanent arrangement of slabs and posts and a removable post having ware supporting means cooperating with said permanent structure for directly supporting ware to be heat treated.

2. A ware supporting superstructure for a kiln car comprising a lower deck, a plurality of posts mounted on said deck, an upper deck mounted on said posts to form a permanent superstructure and a removable post adapted to be placed in position between said decks and to cooperate with some of said first mentioned posts in supporting ware to be heat treated.

3. A ware supporting superstructure for a kiln car comprising a permanent structure for slabs and posts arranged to support inner and outer bungs of ware and a removable post element mounted in said permanent structure and cooperating with some of said post to support the outer bungs of ware.

4. In a kiln car, a supporting superstructure arranged to support a plurality of bungs of flat ware and comprising a permanent arrangement of posts having ware supporting means by which some of the bungs are supported and a removable post having ware supporting means cooperating with part of said permanent structure to support others of said bungs of ware.

5. A ware supporting superstructure for a kiln car comprising a lower deck, a plurality of posts mounted on said deck, an upper deck mounted on said posts to form a permanent superstructure, a removable post adapted to be placed in position between said decks and cooperating with said first mentioned posts to support ware to be heat treated and means in said upper deck for holding said removable element in position.

6. A ware supporting superstructure for a kiln car comprising a lower deck structure having circulating passages therein, a plurality of posts and slabs supported by said lower deck, ware supporting pins mounted in said posts, and a removable post mounted on said deck and having a series of ware supporting pins mounted thereon cooperating with the ware supporting pins on the first mentioned posts to support the ware to be heat treated.

7. In firing ware in tunnel kilns, the method of loading ware fired on a kiln car comprising a ware supporting superstructure which consists in arranging the ware in bungs adjacent the longitudinal center line of the car, inserting a removable supporting element in position in said superstructure and arranging bungs along the outer portion of the car so that they are partially supported by the removable element.

Signed at New Castle, in the county of Lawrence, and State of Pennsylvania, this 14th day of June, A. D. 1927.

GEORGE D. MORRIS.