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GLOSS SETTER

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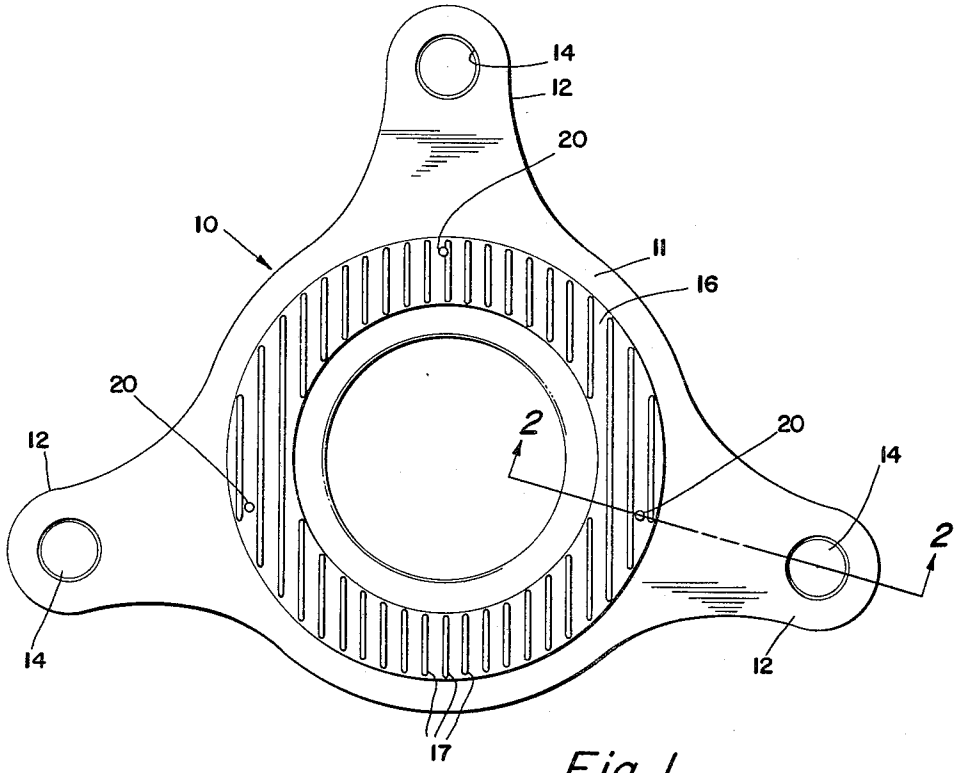


Fig. 1

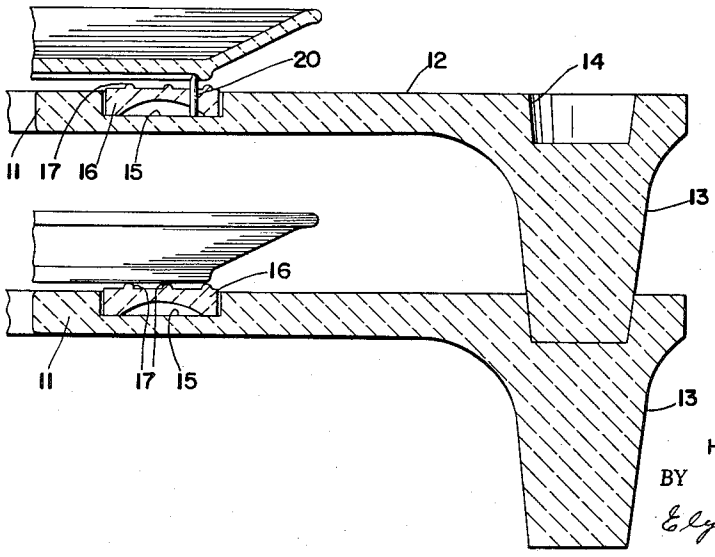


Fig. 2

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GLOSS SETTER

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This invention relates to an improvement in setters for the glost fire of dinnerware and, more particularly, to a setter which permits the glost-firing of dinnerware with either a glazed or unglazed foot.

In the manufacture of glazed dinnerware, there was no satisfactory method of supporting the ware during the glost fire (in the case of vitrified china glazed after the bisque fire) or during the single fire (in the case of so-called semi-vitreous ware in which both the clay body and glaze are fired in a single fire). After the ware has been dipped or coated with unfused glaze in a glazing machine, the potter is faced with the choice of producing the ware with either a glazed or unglazed foot.

If the ware is to be produced with a glazed foot, it is supported on a three-point support provided by three pins or points of refractory material which engage the underside of the ware, frequently under the rim. As the glaze fuses during the fire, it will run and fuse to the supporting points or pins, which must be broken away from the ware after it is removed from the kiln. Often fragments of the refractory material are left in the fused glaze and must be ground away. Even if the pins do break away without leaving fragments, they leave scars or marks which, at best, are unattractive. Not only is the grinding an expensive operation, but the placing of the pins in the saggers or other supports involves a substantial amount of hand labor. The refractory pins themselves, broken and discarded after a single use, are relatively inexpensive; nonetheless they can amount in time to a considerable item of cost, due to the volume consumed.

Alternatively, if the ware is to be produced with an unglazed foot, the dry, unfused glaze is wiped from the bottom of the foot so that, theoretically, when the ware is placed on a refractory crank or setter for the glost fire, there will be no glaze between the setter and the contacting surface of the foot to fuse the two together during the glost fire. Unfortunately, either the glaze may not be completely wiped from the bottom of the foot or, during the fire, some molten glaze on the sides of the foot may run down to the contacting surface of the setter and fuse the ware and setter together. To prevent such fusion, finely powdered infusible flint is spread as a coating on the surface of the setter. Any molten glaze which would otherwise fuse the ware to the setter is absorbed by the flint, which, being non-adherent to the setter, though adhered to the ware by the glaze, thus permits the ware to be removed from the setter after the glost fire; if so, this adhered flint has to be ground off. Even if the ware is made with a very fine and dense bisque-fired body, the unglazed surface of the foot is relatively rough and, in use, tends to pick up soil that is not readily removed in washing. As in the production of ware with a glazed foot, not only is the grinding of the foot, when required, expensive, but additionally the presence of the finely powdered flint in the sagger and on the cranks is a source of trouble; any small particles of flint which may fall on the upper surface of a piece of ware before or during fusion of the glaze will usually spoil the ware and cause it to be rejected.

It is the obect of this invention to provide a gloss setter which, in case ware with a glazed foot is desired, permits the ware to be supported on needles which

leave a very small mark and requires little, if any grinding. Alternatively, and with the same setter, ware with an unglazed foot may be fired without danger of spoiling the ware with powdered flint present in the sagger in which the supported ware is fired.

Another object and advantage of the invention is that it greatly reduces the time and labor involved in loading the sagger in which the ware is fired. Other objects and advantages of the invention will be apparent from the following specification, claims, and drawings, in which:

FIG. 1 is a plan view of a setter made according to this invention.

FIG. 2 is a fragmentary cross-section taken along the line 2—2, showing two setters stacked for firing in a sagger and showing ware placed on the setters, one piece being supported for firing with a glazed foot and the other being supported for firing with an unglazed foot.

As shown in FIG. 1, a setter **10** made according to this invention comprises a central annular crank portion **11** provided with three equally spaced outwardly extending knees **12**, each having a depending leg **13**. The upper side of each knee is provided with a socket **14** to receive the leg **13** of a similar setter so that the setters may be interfitted and stacked in a sagger after ware, such as plates, has been placed thereon. As so described, the setter is of conventional construction. It is made of a strong, dense refractory capable of supporting ware through many firings.

A setter made according to this invention, however, departs from the above-described conventional construction in that it is provided with a groove **15** concentric with the central opening of the annular portion **11**. This groove receives a ring **16**, preferably of a soft, porous refractory; indeed, the refractory of the ring may, though not necessarily so, be of such insufficient structural strength that the setter, if it were made entirely of such material, would not be able to support the ware and other setters stacked on it in the sagger. While there may be a very substantial difference between the structural strength of the refractory of the setter **10** and the porous and relatively fragile refractory of the ring **16**, the refractory of the ring **16** must have sufficient strength and stiffness at the glost firing temperature to retain its shape and be retained within the groove **15** to support the ware during the glost fire.

If the ware is to have an unglazed foot, as indicated on the lower of the two setters shown in cross-section in FIG. 2, the upper surface of the ring **16** is preferably provided with a plurality of ridges **17** upon which the foot of the ware will rest. When so used, the ware is put through the glost fire after glaze is wiped from the bottom of the foot and placed on the rings **16**, the setter and ware are stacked and loaded on saggers, and the saggers are loaded into a kiln. As the setters are removed from the saggers, there may be fused glaze adhering the ring **16** to the ware as the ware is lifted off the setter, causing the ring **16** to be lifted out of its groove **15**. However, due to the soft, porous nature of the refractory of which the ring **16** is made, the ring may be readily broken away. If so, a small amount of the refractory in the ridges **17** may still be adhered to the foot; this, however, is quickly removed in the conventional foot-grinding machine. These rings **16** may ordinarily be used for several subsequent firings until the ridges **17** are too scarred to support the ware without causing the entire ring to be broken when removed from a fired piece of ware. The ring **16** is then simply replaced.

As so described as a setter for the glost firing of ware with an unglazed foot, the setter made according to this

invention avoids the use of powdered flint or sand which might spoil the glaze, and a ring **16** is easily and quickly replaced with less labor and time than is often required for spreading flint.

If the ware is to be produced with a glazed foot, three fine needles **20** are pressed into the soft ring **16** to support the ware, preferably just inside the foot, as shown in the upper view of the setters in FIG. 2. The ware is then rested on the points of the needles and fired after loading the ware and setters in a sagger and loading the sagger into a kiln. After the glost fire and depending upon the thickness of the glaze and its adherence to the metal of the needle, the ware may often be lifted off the needles **20**, leaving only very minute scars or needle holes in the glaze. If the needles are embedded in the glaze so that the ring **16** is lifted out of the groove **15** as the ware is removed from a setter, the ring **16** is separated from the ware by pulling the needles out of the ring; in this latter case, the needles are then separated from the ware by breaking the glaze at the miniscus which adheres the needles to the ware. This scar is very small and seldom objectionably noticeable.

When the ware is supported on the needles **20**, obviously the ridges **17** are superfluous and may be omitted, if desired. Again, however, the needles may be pressed in the ring **16** and the ring placed in the groove **15** with less time and labor than required for placing the conventional ware supporting refractory sagger pins in a sagger.

When the needles **20** are preferably placed in the ring **16** so that the ware is supported thereon just inside the foot, the scars or pin marks, if noticeable at all are located in the most inconspicuous place on the ware. The method of which the pins are made should be stainless steel or other high-temperature ferrous or non-ferrous alloy which retains sufficient stiffness to support the weight of the ware during the glost fire. If of a ferrous alloy, the alloy is preferably such that there is insufficient iron, either free in the alloy or released during the fire, to stain the ware at the point of contact with the needle. The length of the needle is such that, if the weight of the ware pushes it through the soft penetrable ring **16** until the bottom of the needle contacts the groove **15**, the ware will still be supported out of contact with the ring **16**. The diameter of the needle and the sharpness of its ware-supporting point are determined by the stiffness of the alloy at the glost-fire temperature, which is usually less than 1800° F.

As so used for firing ware with a glazed foot, the time and labor involved in loading the ware and its setters in a sagger ready to be fired is substantially less than that heretofore required for insert pins in a sagger and loading ware in the pinned sagger. Also, as a relatively reusable consumable item, the cost of the rings **16** and needles **20** is usually less than the cost of the conventional refractory pins. Even without such savings in labor and material costs, this invention would be preferable over preceding practice because of the relatively unnoticeable supporting marks left in the glazed ware.

Instead of a single ware supporting ring **16**, the relatively soft refractory may consist of three or more inserts in the same locus as the ring **16**. The savings in material cost of such a variation, however, is usually offset by the labor of placing three inserts rather than one. This invention is not to be deemed limited to this specific illustrative embodiment shown but encompasses the several modifications and variations as those skilled in the art will make in the invention as defined in the appended claims.

What is claimed is:

1. A gloss setter for firing footed glazed dishware comprising a crank portion of relatively strong and dense refractory adapted to support its own weight and the weight of ware to be fired on it in a glost fire, said crank portion having at least one recess located on its upper surface and in the locus of the foot of ware to be supported by the crank, an inset of relatively soft, porous, and weak refractory received in said recess, and means supported by said inset extending above the inset to space ware above and out of contact with the upper surface of the crank adjacent the ware supported thereby.

2. A gloss setter as defined in claim 1 in which said recess in the crank is an annular groove having an inner diameter less and an outer diameter greater than the diameter of the foot of ware to be supported and said inset is a ring received on said groove.

3. A gloss setter as defined in claim 2 in which the means extending above the inset is a plurality of integral ridges of the relatively soft and weak refractory.

4. A gloss setter as defined in claim 2 in which the means extending above the inset are at least three metal needles having their lower ends supported in the inset and composed of a metal retaining sufficient stiffness at the temperature of the glost fire to support the weight of ware resting thereon.

5. A gloss setter as defined in claim 2 in which the crank portion is provided with a plurality of integral radially extending knees, each knee having a recess in the upper portion thereof, a depending leg below said recess and integral with said knee, said recess being configured to receive the foot of said leg whereby a plurality of said setters may be stacked in a sagger with sufficient spacing between the central crank portion to support ware for glost firing.

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