July 17, 1962 C. B. MURTON 3,044,132

STOPPER FOR A LADLE OR SIMILAR RECEPTACLE

Filed July 5, 1960

Fig. 1.

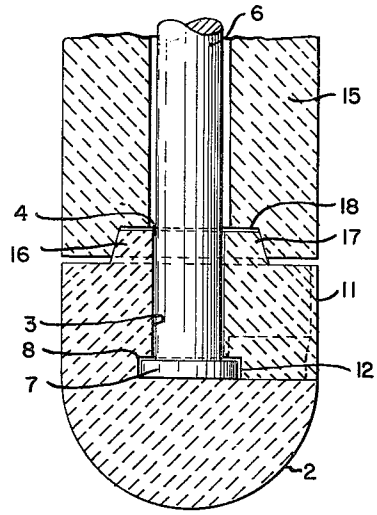


Fig. 2.

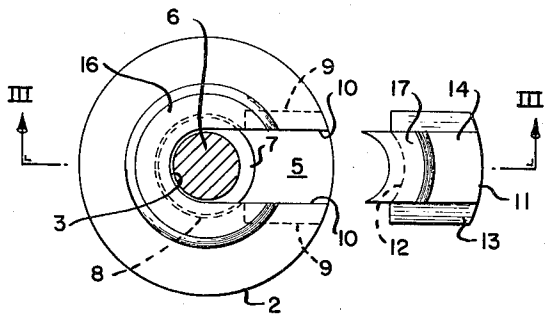


Fig. 3.

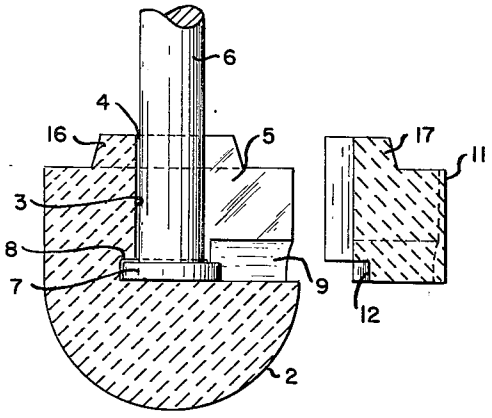
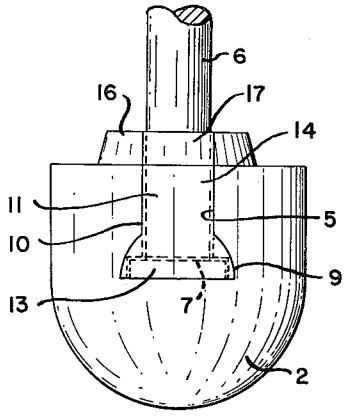


Fig. 4.



INVENTOR

Crawford B. Murton

By Hooper, Leonard & Dalf

his attorneys

United States Patent Office 3,044,132 Patented July 17, 1962

3,044,132
STOPPER FOR A LADLE OR SIMILAR RECEPTACLE

Crawford B. Murton, Churchill Borough, Pa., assignor to Vesuvius Crucible Company, Swissvale, Pa., a corporation of Pennsylvania

Filed July 5, 1960, Ser. No. 40,606
1 Claim. (Cl. 22—85)

This invention relates to a stopper for a ladle or similar receptacle and has to do particularly with the manner of attachment of the stopper rod to the stopper head. I utilize a stopper head having therein an upwardly open well receiving the lower portion of the stopper rod and novel and easily appliable means for locking the stopper rod to the stopper head.

I provide a stopper for a ladle or similar receptacle comprising a refractory head having therein a well open upwardly and laterally, a rod having at its bottom a lateral projecting disposed with its lower portion in the well of the head and projecting upwardly therefrom together with a holding member insertable laterally into the head to close the lateral opening of the well and maintain the rod connected to the head. A portion of the lateral projection at the bottom of the rod may underlie a portion of the head and the holding member may maintain that portion of the lateral projection of the rod underlying a portion of the head. I provide means maintaining the holding member against laterally outward movement.

The head preferably has means maintaining the holding member against upward movement relatively to the head, in which case either or both of the head and holding member may have a portion overlying the lateral projection at the bottom of the rod to maintain the rod connected to the head. I prefer to provide each of the head and holding member with a portion overlying the lateral projection at the bottom of the rod. The means maintaining the holding member against laterally outward movement relatively to the head may be a sleeve surrounding the rod above the head and engaging the head and holding member.

In a preferred form my stopper for a ladle or similar receptacle comprises a refractory head having therein a well open upwardly and laterally, the lateral opening of the well having a lower portion of relatively great width and an upper portion of relatively less width, a rod having at its bottom a lateral projection disposed with its lower portion in the well of the head and projecting upwardly therefrom and preferably a holding member insertable laterally into the head to close the lateral opening of the well, the holding member having a lower portion of relatively great width and an upper portion of relatively less width shaped to fit the lateral opening of the well whereby the holding member is maintained against upward movement relatively to the head, at least one of the head and holding member having a portion overlying the lateral projection at the bottom of the rod. As indicated above I preferably also provide means maintaining the holding member against laterally outward movement relatively to the head.

Other details, objects and advantages of the invention will become apparent as the following description of a present preferred embodiment thereof proceeds.

In the accompanying drawings I have shown a present preferred embodiment of the invention in which

FIGURE 1 is a fragmentary axial cross-sectional view through a ladle stopper head and the lower portion of the stopper rod showing one form of my novel means for attaching the stopper rod to the stopper head;

FIGURE 2 is a plan view of the stopper head and holding member in exploded relationship;

FIGURE 3 is a cross-sectional view taken on the line III—III of FIGURE 2; and

FIGURE 4 is an elevational view of the head, rod and holding member viewed from the side of the head at which the holding member is disposed.

Referring now more particularly to the drawings, the ladle stopper head is designated generally by reference numeral **2**, the head being formed of refractory material as well known to those skilled in the art. The head **2** has therein a well **3** which is open upwardly at **4** and laterally at **5**, viewing FIGURE 3. A conventional ladle stopper rod is shown at **6**, the rod having the usual circular flange **7** at its bottom. The rod is disposed with its lower portion in the well **3** of the head **2** and projecting upwardly therefrom as shown. The head **2** is shown as having a kerf **8** cut therein at the bottom of the well **3** receiving a portion of the flange **7**.

The lateral opening **5** of the well has a lower portion **9** of relatively great width and an upper portion **10** of relatively less width as shown in FIGURE 4. I provide a holding member designated generally by reference numeral **11** which is insertable laterally into the opening **5** in the head which leads to the well **3**. In the form shown a kerf **12** is cut in the holding member **11** so that when the holding member **11** is fully introduced into the opening **5** as shown in FIGURE 1 the flange **7** will be received within the kerf **12** just as it is received within the kerf **8** of the head; the flange thus underlies a portion of the head **2** and a portion of the holding member **11**.

The lower portion of the holding member **11** is designated **13** and is of relatively great width while the upper portion of the holding member **11** is designated **14** and is of relatively less width, the holding member being shaped to fit the lateral opening **5** of the well whereby because of the fact that both the holding member and the opening have a lower portion of greater width than the upper portion thereof the holding member is maintained against upward movement relatively to the head. In such a structure it is not essential in order to maintain the connection between the rod and head that both the head and the holding member have portions overlying the rod flange; either one or the other of the head and holding member may have a portion overlying the rod flange. In either case the introduction of the holding member laterally into the opening **5** into position against the rod as shown in FIGURE 1 insures maintaining the connection between the rod and the head.

I provide means maintaining the holding member **11** against laterally outward movement relatively to the head **2**. Such means may assume various forms, but I prefer to employ a sleeve **15** shown in FIGURE 1. The sleeve interfits with the head and holding member. In the form shown each of the head and holding member has an upwardly projecting inner portion, such portion of the head being designated **16** and such portion of the holding member being designated **17**. The bottom of the sleeve **15** is annularly cut out at its inner portion as shown at **18** so that when the sleeve **15** is moved downwardly after the holding member **11** has been moved inwardly to the position shown in FIGURE 1 the bottom portion of the sleeve embraces the upper portions of the head and holding member and thus inhibits outward movement of the holding member and consequently insures maintenance of the connection between the rod and the head.

The rod may be inserted into the head through the lateral opening **5** as that opening is of such size and shape as to receive the rod including the flange **7** as shown in FIGURE 4. This greatly facilitates the application of

the head to the rod and also the changing of stopper heads.

While I have shown and described a present preferred embodiment of the invention it is to be distinctly understood that the invention is not limited thereto but may be otherwise variously embodied within the scope of the following claim.

I claim:

A stopper for a ladle or similar receptacle comprising a refractory head and a stopper rod, the refractory head having therein an upwardly open well and a lateral opening through the side of the refractory head communicating with the well and extending to the top of the head of such size as to permit the lower portion of the rod to be inserted laterally therethrough from the outside into the well, the rod being disposed with its lower portion in the well of the head and projecting upwardly therefrom and with a portion of its lateral projection underlying a portion of the head, a holding member insertable laterally into the head to close the lateral opening communicating with the well and maintain said portion of the lateral projection of the rod underlying said portion of the head, the holding member interfitting with the head so that the holding member is restrained by the head against upward movement relatively to the head, and means maintaining the holding member against laterally outward movement.

References Cited in the file of this patent

UNITED STATES PATENTS

117,918	Ostrander	Aug. 8, 1871
2,296,059	Sage	Sept. 15, 1942

FOREIGN PATENTS

12,291	Great Britain	1904

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,044,132 July 17, 1962

Crawford B. Murton

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 1, line 20, for "projecting" read -- projection --; line 50 strike out "preferably".

Signed and sealed this 30th day of October 1962.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents