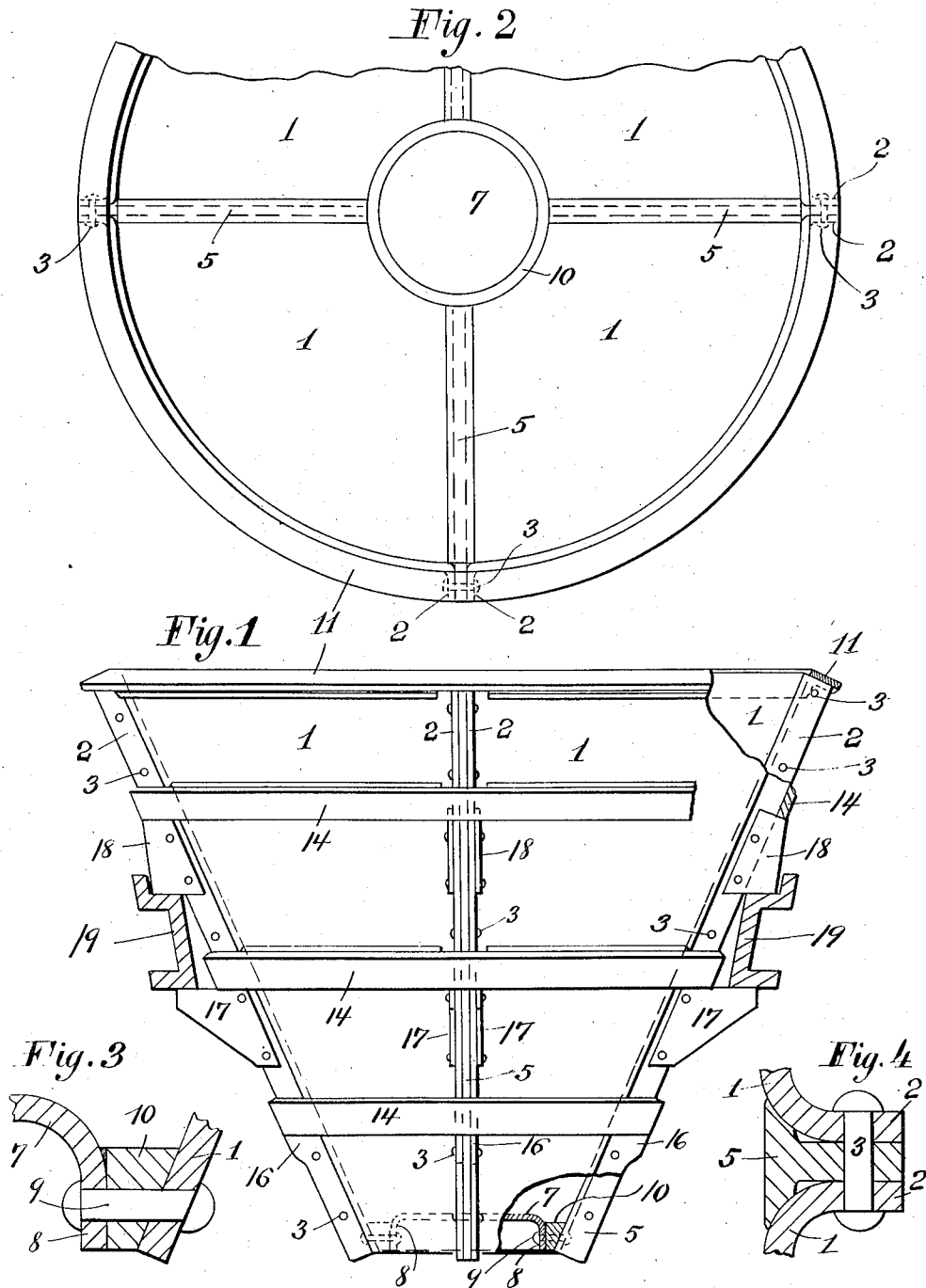


C. P. ASTROM.
BUILT UP LADLE.
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1,006,519.

Patented Oct. 24, 1911.



Witnesses:

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UNITED STATES PATENT OFFICE.

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BUILT-UP LADLE.

1,006,519.

Specification of Letters Patent.

Patented Oct. 24, 1911.

Application filed May 6, 1910. Serial No. 559,766.

To all whom it may concern:

Be it known that I, CARL P. ASTROM, a citizen of the United States, residing at Hasbrouck Heights, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Built-Up Ladles, of which the following is a full, clear, and exact specification.

This invention relates to built up ladles, and more particularly has reference to what are commonly termed "cinder ladles", that is ladles used for carrying away slag, etc., from blast furnaces, or foundries. Such ladles are commonly made of cast iron, and are not ordinarily lined with refractory material, and consequently are subject to burning out and other accidents. Where a ladle is cast in one piece, and especially a ladle of large capacity, when a burn out occurs the ladle is useless and must eventually be scrapped, as the value of the metal is considerable. In order to utilize the metal such a casting must be broken up, which has been found difficult and expensive in the case of large and heavy cast ladles.

The object of this invention relates to the construction of a built up ladle composed of plates wherein the joints between contiguous plates will all be subject to equal temperatures, and thereby racking and shearing of the fastenings avoided.

A further object of the invention is to provide a built up ladle having the joints of contiguous plates always subject to equal temperature, and means whereby the interior of the ladle will be smooth and free from interstices tending to cause the skull to bind and fill up when the ladle is dumped.

A further object of the invention is to provide improved supporting means for a built up ladle.

The invention will be more fully understood in connection with the accompanying drawing, wherein—

Figure 1 shows an elevation of a ladle embodying the invention; Fig. 2 is a top plan view; Fig. 3 is a detail view showing the manner of securing the bottom, and Fig. 4 is a detail view showing the preferred manner of securing the plates, and of forming a smooth interior.

According to this invention, I form a ladle body by outwardly flanging a number of segmental plates 1, so as to have vertical

external flanges 2 which will be secured together by rivets or other fastenings 3. In order to avoid corners and interstices where the plates 1 bend outwardly, I provide filling blocks 5 which are shaped to fit the outwardly curved portions of the plates 1 and may be held by the fastenings 3. Thereby, a ladle having a practically smooth interior will be provided in which the skull will not catch and bind. It will be seen that when a ladle thus constructed is heated by pouring molten or hot material therein, such as cinder, adjoining portions of the plates 1 and the flanges 2 will be heated to the same temperature, and consequently there will not be any transverse shearing strains on the fastenings 3 as might happen where contiguous portions of the plates, or of the fastenings, are subjected to different temperatures. The filling blocks 5 are also subject to the same conditions and will expand and contract with the plates without straining the fastenings, which latter will be subject throughout to practically the same temperature. A similar arrangement is provided for securing the bottom, as in Fig. 3.

7 represents a flanged or dished plate having a flange 8 which is secured to the lower ends of the annular body plates 1 by fastenings 9, an annular filling rim 10 being here used to fill up the space and avoid corners which would cause the skull to bind. It will be seen that the fastenings 9 and the bottom flange 8 will be subject to practically even temperature, and thereby shearing strains avoided. Furthermore, by this method of externally fastening the side plates together, and the bottom plate to the side plates, no part of the fastening is inside the ladle and subjected to direct heat of the contents, which, so far as I am aware, is broadly new and renders a built up ladle more durable and less liable to deterioration of the fastenings through the constant expansion and contraction they necessarily have to withstand. By this method shearing strains are practically entirely done away with, since the parts contiguous to the fastenings are always of practically the same temperature, one part of the fastening not being at a higher temperature than another part.

11 represents a top hoop or rim comprising an annular angle bar externally riveted

to the tops of the plates and cut out to overlie the flanges 2 and filling blocks 5, as shown in Fig. 2. Thereby, the flanges support and strengthen the rim 11, and the latter prevents injury to the edges of the plates 1. Intermediate hoops 14, 14, 14 are shrunk or otherwise fastened on the outside of the body, the lower hoop being held by lugs 16 in the flanges 2 and the upper hoops by lug plates or cast lugs 17, 18 riveted to the flanges 2. These pairs of lugs 17 and 18 also act as feet to support the bail or yoke 19 on which the ladle is commonly mounted in a car frame.

From the foregoing description, it is thought that the objects and advantages of the invention will be fully understood, and it will be seen that I have provided a built up plate ladle having external fastenings and a smooth interior, whereby the expansion and contraction will not destroy or weaken the fastenings. The external flanges furthermore add stiffness to the ladle and render it strong, while at the same time comparatively light as compared with its capacity. When the ladle is worn out, it can be readily cut up to enable the metal to be recovered, without much expense.

Modifications and changes may be made in the details and construction herein shown without departing from the scope of the invention.

Having thus described my invention, I declare that what I claim as new and desire to secure by Letters Patent, is—

1. A ladle comprising segmental plates having outwardly turned edges, securing means passing through said edges, and interior filling blocks between said plates.

2. A ladle comprising segmental plates

having outwardly turned edges, external securing means passing through said edges, and filling means held between said plates by said fastening means for forming an interior surface free of interstices.

3. A ladle comprising an annular body portion and a bottom plate secured thereto, said bottom plate being provided with an outwardly turned flange, fastenings passing through said flange and annular body, and a filling ring between the bottom plate and the body.

4. A ladle comprising an annular body formed of outwardly flanged segmental plates, filling blocks interposed between said plates, fastenings securing said flanges and blocks together, an inverted flanged bottom member, a filling ring interposed between said bottom and the body, and fastenings for securing said bottom member and filling ring to said body.

5. A ladle comprising an annular body formed of outwardly flanged segmental plates, external fastenings passing through said flanges, a top hoop passing exteriorly around said body and overlying said flanges, and a bottom member secured to one end of said body.

6. A ladle comprising an annular body formed of outwardly flanged segmental plates, external fastenings passing through said flanges, external hoops around said flanges, and a bottom member secured to one end of said body.

In testimony whereof I affix my signature, in presence of two witnesses.

CARL P. ASTROM.

Witnesses:

J. S. WOOSTER,
GEO. N. KERR.