

(No Model.)

C. MERCADER.
LADLE NOZZLE.

No. 481,041.

Patented Aug. 16, 1892.

Fig. 1.

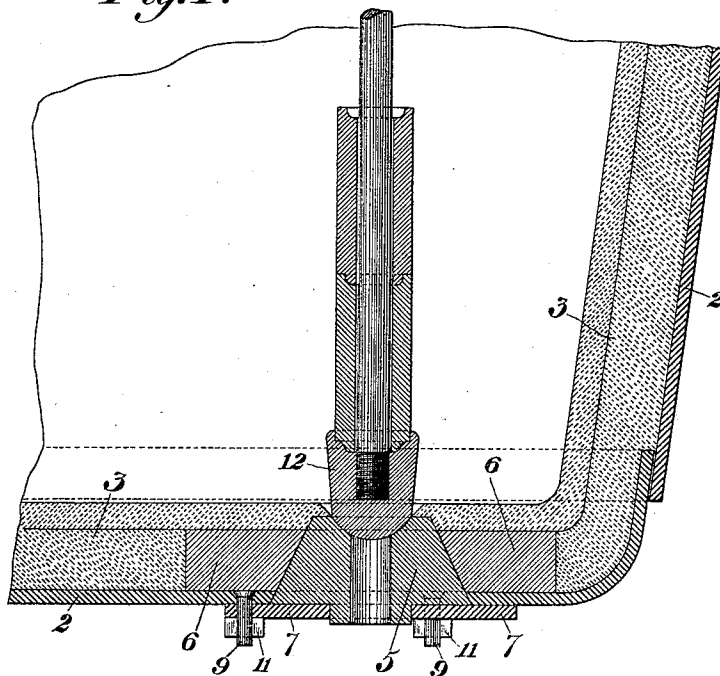
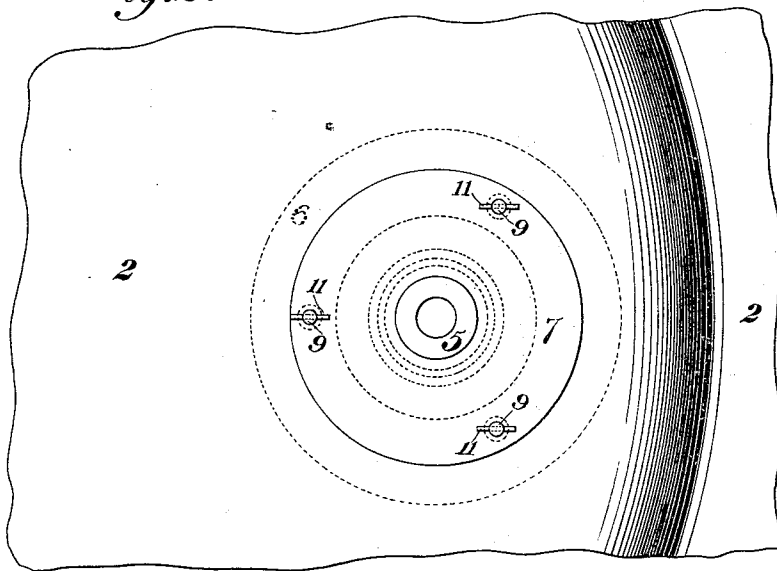


Fig. 2.



WITNESSES

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CAMILLE MERCADER, OF BRADDOCK, PENNSYLVANIA.

LADLE-NOZZLE.

SPECIFICATION forming part of Letters Patent No. 481,041, dated August 16, 1892.

Application filed February 10, 1892. Serial No. 420,950. (No model.)

To all whom it may concern:

Be it known that I, CAMILLE MERCADER, of Braddock, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Ladle-Nozzles, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical sectional view through the nozzle and ladle with the stopper in place, and Fig. 2 is a bottom plan view of the nozzle portion of the ladle with the stopper removed.

My invention relates to that class of ladles for pouring steel, which are known in the art as "bottom-pour" ladles; and it consists in a downwardly-removable tapering nozzle, which is held in place by any suitable means during the pouring operation and replaced by a new nozzle after each pour, as well as in the particular construction and arrangement of the parts, as hereinafter more fully described, and set forth in the claims.

In the drawings, 2 indicates the outer iron shell of the ladle, this shell being lined with suitable refractory material 3, as ordinarily, and provided in its bottom with a hole of sufficient area to admit the nozzle 5. This nozzle is tapered upwardly, as shown, being in the form of the frustum of a cone and fits in a correspondingly-tapered hole in an annular brick or refractory ring 6, which incloses the orifice in the casing. The refractory lining 3 is cut away to admit this ring 6, which rests upon the interior of the casing and upon its inner surface is flush with the brick lining 3.

To hold the nozzle in place while pouring, I employ a plate 7, provided with perforations through which pass the pins 9, projecting from and secured to the casing, and with a central hole to receive the central part of the nozzle-brick. The pins 9 are suitably slotted to receive the keys 11, which are driven there-through and serve to force the nozzle snugly against its tapered seat in the annular brick 6. 12 represents a stopper, which rests in a downwardly-tapered depression in the nozzle and is raised and lowered in the ordinary manner. In operating with my improved nozzle the steel is poured as ordinarily, the keys are then driven out of the pins, and the support-

ing-plate 7 and nozzle removed. A new nozzle is then luted with clay and slipped into place in the ring 6 and the parts replaced, and as the thickness of the clay is so little that it is dried very rapidly by the heat of the ladle the ladle is immediately ready for a second cast.

The advantages of my invention are obvious. The lining of the ladle will considerably outwear the nozzle; but at each cast the nozzle becomes scored and grooved by the hot steel passing therethrough, and in ordinary practice at the following casts the nozzle leaks and wastes the steel while the ladle is being moved from one mold to the next. With my invention, the nozzle being rendered easily removable from the outside after each cast, the exit-hole for the steel is kept perfectly round and smooth by successive substitution of new nozzles, and leaking and scattering of the metal are prevented. It is evident that the brick 6 may be square, hexagonal, or of any form desired, and the nozzle itself might be of pyramidal shape.

I am aware that it has been proposed to construct a ladle-nozzle so that it shall be removable upwardly from its seat in the bottom. This, however, cannot be done successfully while the ladle is in use or during the short intervals between casting, because of the heat in the interior of the ladle and because of the fact that the solidification of the slag above the nozzle cements it, so that it is practically impossible of access from above without tearing out the ladle-lining. Furthermore, where the nozzle is inserted and removable from above, it frequently happens in use that the stopper sticks to the nozzle, and when the stopper is lifted to loosen it pulls the nozzle with it and spills the charge of the ladle. This cannot happen with my improvement in which the nozzle is tapered, so that it is removable outwardly and so that lifting of the stopper cannot unseat the nozzle, even if these parts should adhere with considerable tenacity.

The means for holding the nozzle in place may be entirely altered, and many other variations will suggest themselves to those skilled in the art without departure from my invention.

I claim as my invention—

1. A ladle provided with a hole for the in-

section of a nozzle, a nozzle arranged to be removed outwardly through said hole, and means for holding said nozzle in place, in combination with an interior vertically-movable stopper, substantially as and for the purposes described.

2. A ladle provided with an inwardly-tapering nozzle set in a hole, from which it is removable outwardly, and means for removably holding said nozzle in place, in combination with an interior vertically-movable stopper, substantially as and for the purposes described.

3. A ladle provided with an annular ring and having interior inwardly-tapering sides, a nozzle having corresponding inwardly-tapering sides set in said ring, from which it is re-

movable outwardly, and means for holding the nozzle in said ring, in combination with an interior vertically-movable stopper, substantially as and for the purposes described.

4. A ladle having a nozzle with inwardly-tapering sides and an external apertured plate bearing upon said nozzle and removably held in place, in combination with an interior vertically-movable stopper, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 30th day of January, A. D. 1892.

CAMILLE MERCÂDER.

Witnesses:

THOMAS W. BAKEWELL,
W. B. CORWIN.