H. SWANK.

Stopper for Ladles.

No. 161,644. Patented April 6, 1875

Fig 1.

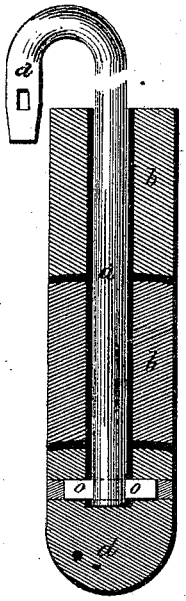
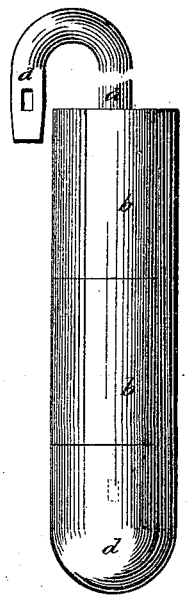


Fig 2.



WITNESSES.

J. Wm. Gaines.
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per F. A. Lehmann Atty

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UNITED STATES PATENT OFFICE.

HIRAM SWANK, OF JOHNSTOWN, PENNSYLVANIA.

IMPROVEMENT IN STOPPERS FOR LADLES.

Specification forming part of Letters Patent No. **161,644**, dated April 6, 1875; application filed February 9, 1875.

To all whom it may concern:

Be it known that I, HIRAM SWANK, of Johnstown, in the county of Cambria and State of Pennsylvania, have invented certain new and useful Improvements in the Protection of Iron Bars of Ladle-Stoppers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in stoppers for ladles; and it consists in making the sleeve that protects the iron rod in short sections, and securing them to the rod by means of a mixture of black-lead and fire-clay, as will be more fully described hereafter.

The accompanying drawings represent my invention. *a* represents an iron bar, called by workmen a "goose-neck," which is used in the ladle from which the molten metal is poured, through a nozzle at the bottom, into molds or ingots. To the end of this bar is secured, by means of a small key, *o*, which passes through the bar, a stopper, *d*, made of black lead, (plumbago,) to fit in the nozzle, which stopper is controlled and operated by the iron bar *a*, to increase or decrease the flow of metal, or to stop it altogether, by partly withdrawing the stopper out of the nozzle or pressing it entirely into it. *b* represents a short section of the sleeve, generally from three to five inches in length, and of a thickness to correspond with the thickness of the bar over which it is passed. The sleeve is made of fire-clay, or of fire-clay and black-lead, and its sections are cylindrical in form. The hole in the sleeve is somewhat larger than the bar, and when a sufficient number of sections have been placed upon the bar, the lowest one in contact with the stopper, the one on top is keyed to the bar. Into the space between the bar and the inside of the sleeve a cement, consisting of black-lead and fire-clay, is poured, which flows into the joints between the sections, and fills the space intervening between the bar and its covering, and unites the sleeve to the stopper. Thus one solid sleeve of incombustible material is formed over the bar, which resists the effects of the intense heat of the molten metal better than any other means heretofore adopted. The length of the sections *b* may be, to suit the occasion, from one inch to as many as may be found suitable. By making the sleeve in sections, as above described, I am enabled to make the sections and then place them in an oven and bake them, whereby they become equal in resisting power to heat to the best fire-brick, and will stand at least six heats. Heretofore it has been found impossible to make a full-length sleeve and then bake it, as the clay would warp and shrink to such an extent as to be impossible to insert the rod. The only way, then, that the sleeve could be applied to the rod was to take the composition while in a plastic condition and daub it on the rod, dry it, and then use it in its raw condition. As the raw material has but little resisting power to heat, a sleeve thus made will stand but a single heat, has then to be removed and replaced by another. By making the sleeve in short sections and baking them they can be kept constantly on hand, are easily applied, will stand the most intense sudden heat and cooling, and will last fully six times as long as any that are now used.

Having thus described my invention, I claim—

A stopper for ladles, consisting of the short baked sections *b d*, secured to the rod *a* by means of a cement of fire-clay and black-lead, substantially as shown and described.

In testimony that I claim the foregoing, I have hereunto set my hand this 4th day of February, 1875.

HIRAM SWANK.

Witnesses:
GEORGE SHAFFER,
J. C. MALOY.