A. J. HAWS.
Stopper-Sleeve.

No. 205,084. Patented June 18, 1878.

Fig. 1.

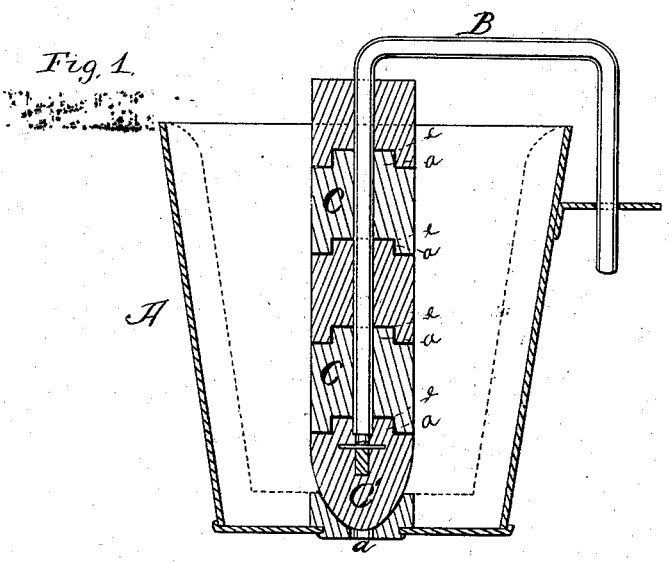
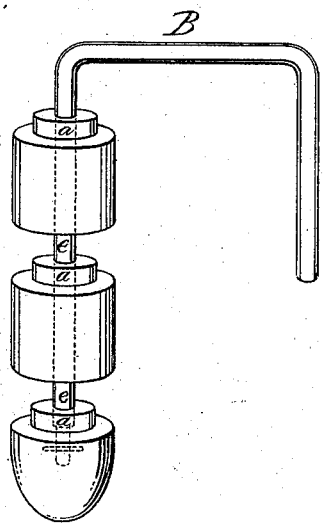


Fig. 2.



WITNESSES
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UNITED STATES PATENT OFFICE.

ANDREW J. HAWS, OF JOHNSTOWN, PENNSYLVANIA.

IMPROVEMENT IN STOPPER-SLEEVES.

Specification forming part of Letters Patent No. **205,084**, dated June 18, 1878; application filed May 9, 1874.

To all whom it may concern:

Be it known that I, ANDREW J. HAWS, of Johnstown, in the county of Cambria and State of Pennsylvania, have invented a new and valuable Improvement in Stopper-Sleeves; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawing is a representation of a sectional view of my device, and Fig. 2 is a detail view.

The object of this invention is to provide a stopper having a protected stem or rod for use in the casting-ladles which receive the melted steel from the converters; and it consists in the construction and novel arrangement, in connection with a stopper-section and its rod, of short perforated sections or sleeves, of baked clay or other refractory material, having their upper and lower ends provided with recesses and projections to engage with each other when the sleeves are placed on the rod or stem, which is designed to be made of iron, and consequently liable to melt up at once in the fluid steel unless protected, all as hereinafter fully shown and described.

In the annexed drawings, the letter A designates the ordinary casting-ladle for melted steel, which is designed to convey the same from the converter to the ingot-molds. This ladle is constructed with an aperture in its bottom, in which is seated a perforated brick of refractory material, as shown at *a*, through which the melted steel is designed to flow into the ingot-molds. The aperture *a* is designed to be closed by means of a stopper-head, C′, which is secured to the lower end of the rod or stem B. This stopper head or valve is made of baked fire-clay or other highly refractory substance.

C C designate the perforated clay sections, which are slipped on the rod, and successively engage with each other end to end by means of the annular projections or lugs *a* and recesses *e*, which are formed at their ends, a lug being formed at one end and a recess at the other end of each section. The stopper head or valve C′ is also formed with a lug or recess to engage with the corresponding recess or lug of the section next above it. In this manner the rod is protected by the sections to a sufficient height to reach above the surface of the melted steel in the ladle.

I am aware that it is not new to put above the stopper-plug a single baked sleeve extending to the top of the rod, and hence I do not claim such invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

The stopper for steel ladles, consisting of the rod B and the short perforated baked-clay sections C C C′, secured on said rod, and engaging with each other by the end projections *a* and end recesses *e*, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

ANDREW J. HAWS.

Witnesses:
C. T. FRAZER,
W. M. BAKER.