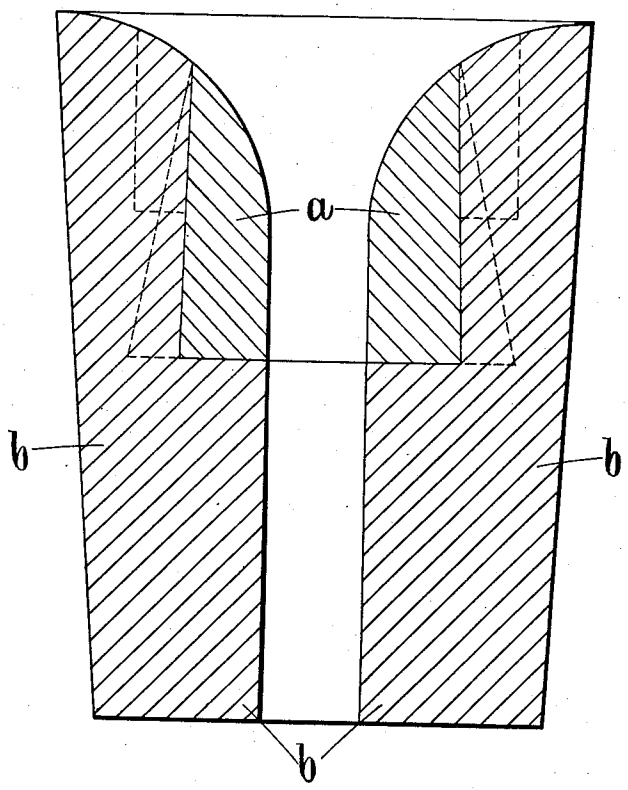
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NOZZLE FOR LADLES USED IN POURING MOLTEN METAL

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# UNITED STATES PATENT OFFICE.

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## NOZZLE FOR LADLES USED IN POURING MOLTEN METAL.

Application filed June 11, 1926, Serial No. 115,167, and in Great Britain June 11, 1925.

This invention relates to the nozzles of ladles used in pouring molten metal, more especially steel, into ingot or other moulds. These nozzles have heretofore generally been formed of fireclay, rock ganister, or a mixture of similar minerals, moulded and backed in a kiln, which type is open to the objection of erosion of the bore hole; or, they have been formed of graphite or magnesite and objections to the latter are that on account of its being such a rapid conductor of heat "shankers" (similar to icicles) form upon the lower edges of the nozzle where it protrudes from the ladle bottom, from the same cause and the unwearable bore of the magnesite nozzle it is difficult to preserve an even pouring speed especially when the ladle is nearly empty owing to the steel or the like having cooled somewhat by that time and become less fluid and owing also to the absence of pressure on the nozzle which would exist, for instance, when the ladle contained 50 or 60 tons of metal; a nozzle has also been made with the object of combining the best features of the fireclay and magnesite nozzles by forming the upper part of fireclay and the lower or outlet of magnesite, this does not however successfully meet all difficulties as the varying size of bore of the two parts of the nozzle induces rather a spattering form of stream, and the shanker trouble still remains.

Our invention is designed to more effectually overcome the foregoing difficulties and relates to an improvement in or modification of the invention of our prior British Patent No. 224,113, in which the upper and lower portions are of fireclay or the like and the central portion is of magnesite.

In our present invention the combination of fireclay or the like and magnesite is retained, but the magnesite may be in any position other than the centre, as set forth in our said prior patent, provided that the outlet is of fireclay.

The drawing which forms a part of this specification is a section through a nozzle constructed according to our invention.

In carrying our said invention into effect we provide the upper or inlet portion with a magnesite liner *a* surrounded by fireclay *b*, or alternatively the upper portion may be constructed wholly of magnesite; further the magnesite portion may extend any distance down and internally of the nozzle and be of any thickness or varying thicknesses that may be desired; it may be of wedge-shape or stepped form as shown in dotted lines, or more than one magnesite liner or block may be employed, with fireclay in between said magnesite portions.

In all cases however we construct the lower or outlet portion of the nozzle of fireclay or some other analogous material to remove the disadvantages hereinbefore set forth.

Having now described our invention, what we claim as new and desire to secure by Letters Patent is:—

1. In a foundry ladle, a nozzle composed of fireclay and a magnesite, the outlet portion of the nozzle being constructed of fireclay and the inlet portion thereof being constructed of magnesite.

2. A nozzle for foundry ladles, as claimed in claim 1, in which the same is composed of fireclay with a magnesite liner at the inlet portion thereof.

In testimony whereof we affix our signatures.

JOHN KNOWLES HASSALL.
ANDREW HARRIS.