

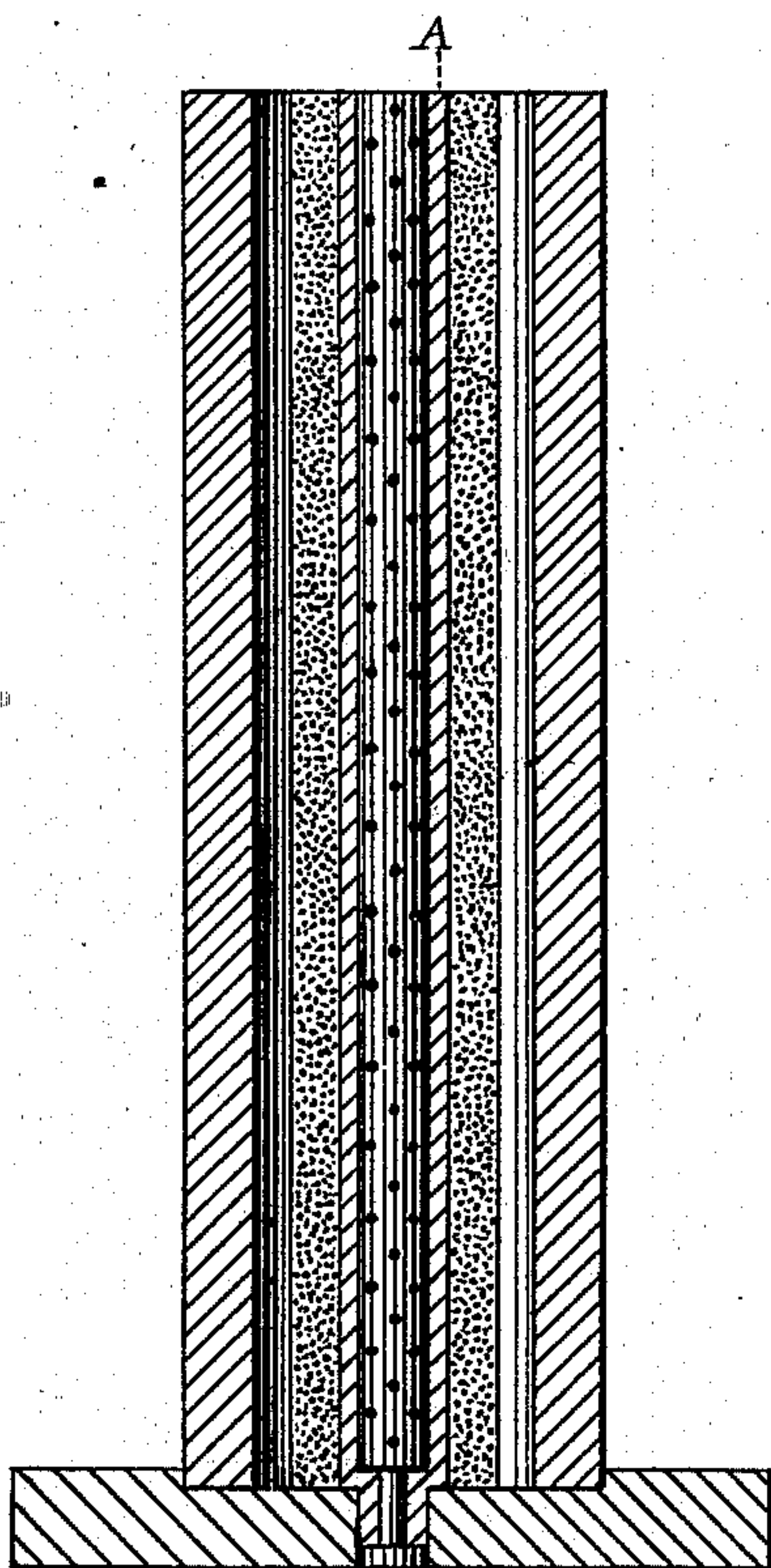
(No Model.)

J. A. HERRICK.  
CORE FOR CASTING STEEL.

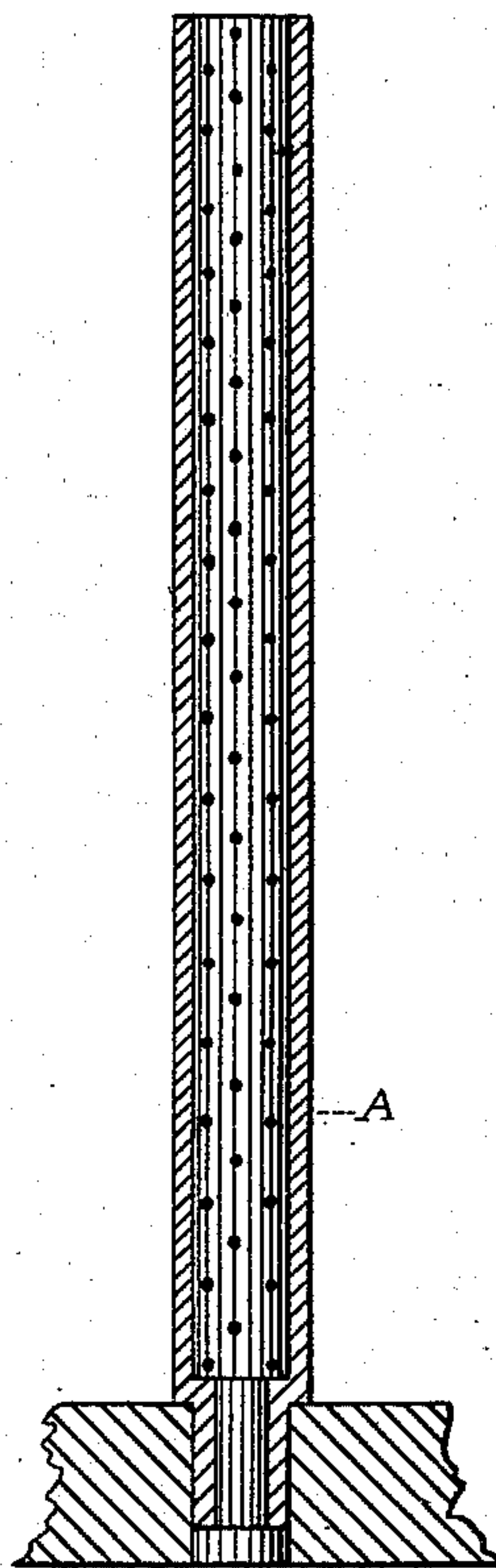
No. 282,518.

Patented Aug. 7, 1883.

*Fig. 1.*



*Fig. 2.*



WITNESSES

*C. H. Dyer.*  
*W. G. Donnelly*

INVENTOR

*James A. Herrick*  
*by Leggett & Leggett*

ATTORNEYS



# UNITED STATES PATENT OFFICE.

JAMES A. HERRICK, OF CLEVELAND, OHIO.

## CORE FOR CASTING STEEL.

SPECIFICATION forming part of Letters Patent No. 282,518, dated August 7, 1883.

Application filed April 21, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES A. HERRICK, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful

5 Improvements in Cores for Casting Steel; 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 appertains to make and use the same.

10 My invention relates to cores for use in casting hollow steel ingots; and it consists in the peculiar construction of the same, as will be hereinafter fully set forth and claimed.

15 In the drawings, Figure 1 is a longitudinal vertical section, taken through the center of my core and a mold. Fig. 2 is a view in section of the perforated core-iron.

Heretofore cores have been made for casting various kinds of molten metal, in which hollow perforated core-irons have been used, such devices being covered with hay or straw, and with loam, common earth, or sand, as described in Overman's Molder and Founder, page 89, and in a practical treatise on casting and founding, (Spetson, pages 211, 212, and 213,) and in English Patent No. 88,338 of 1841; but cores of this character cannot be used in casting open-hearth steel, owing to its high temperature, which causes the material of which

20 low perforated core-irons have been used, such devices being covered with hay or straw, and with loam, common earth, or sand, as described in Overman's Molder and Founder, page 89, and in a practical treatise on casting and founding, (Spetson, pages 211, 212, and 213,) and in English Patent No. 88,338 of 1841; but cores of this character cannot be used in casting open-hearth steel, owing to its high temperature, which causes the material of which

30 such cores are made to throw off such an amount of gas as to render it impossible for the volume to escape as fast as it is generated, the result of which is to leave in the casting what are termed "gas-holes;" and a further

35 objection is that the earthy substance with which the outer surface of such cores is covered becomes fused in casting metals of a temperature equal to that of open-hearth steel, thus leaving upon the inner surface or surfaces

40 of the casting a scale or glazing which cannot be removed, and which is injurious to the after-working of the metal, and to the metal itself.

I am also aware of the existence of a patent

45 to George Cowing, of March 4, 1879, No. 212,902, in which there is described a core made of silica; but such cores cannot be used to advantage in the casting of metals of such high temperature as open-hearth steel, as in such

50 cases the gas generated cannot escape without traversing the entire length of the core, which

would not be possible with sufficient rapidity to prevent the formation of blow-holes in the casting.

My invention has for its object the removal 55 of the objections above referred to by providing a core, the central portion of which consists of a hollow perforated core-iron, which is covered with pure or nearly pure silica, through which the gases pass to the hollow 60 core as fast as they are generated, the device being illustrated in the accompanying drawings.

A is a hollow perforated tube, which is preferably made open at its upper and lower ends 65 to allow of the free passage of air through the same from bottom to top. This hollow perforated core-iron is provided with a covering consisting of a mixture of pure or practically pure silica and a binder, which may consist of 70 flour-paste, glue-water, sour beer, or any other suitable substance containing no carbon, alkalies, metallic oxides, or other elements that would operate in the presence of excessive heat of molten, open-hearth, or other similar steel, 75 to form a flux whereby fusion with the core would occur, and thus cause a glaze or scoria on the interior of the casting.

In forming cores for castings having large apertures in them I prefer to increase the 80 diameter of the core-iron to such an extent as to leave only sufficient room for a coating of silica sufficiently thick to resist the action of the metal upon the core-iron, but not so thick as to cause a serious obstruction to the passage 85 of the gas through it.

I also prefer to use a wash consisting of finely-powdered silica, mixed with a binder which contains none of the objectionable elements as above mentioned, it being only used to fill up 90 the rough and uneven surface of the core. The covering of silica over the hollow perforated piece allows of the escape of gases from the melted metal, but is impervious to the metal itself. Thus allowing of the escape of gases from the 95 melted metal prevents or reduces the liability of the formation of blow-holes, and the silica being a well-known refractory substance, and containing no carbon, alkalies, metallic oxides, or other like elements, is the only practical 100 covering for a core to be used in casting open-hearth or like steels.



What I claim is—

In a core for use in casting steel, the combination, with a perforated and ventilated center piece, of a covering consisting of a mixture of  
5. pure or practically pure silica and a binder, substantially as and for the purposes shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES A. HERRICK.

Witnesses:

W. E. DONNELLY,  
JNO. CROWELL, Jr.