

Feb. 28, 1939.

H. COPE

2,148,856

STOCK LINE WEARING ELEMENT

Filed June 16, 1938

FIG. 1.

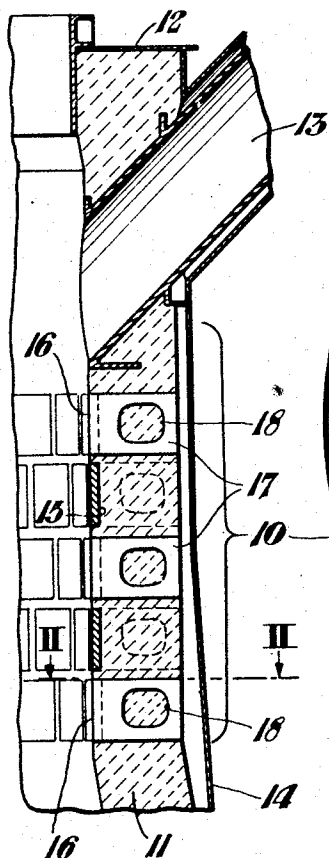


FIG. 2.

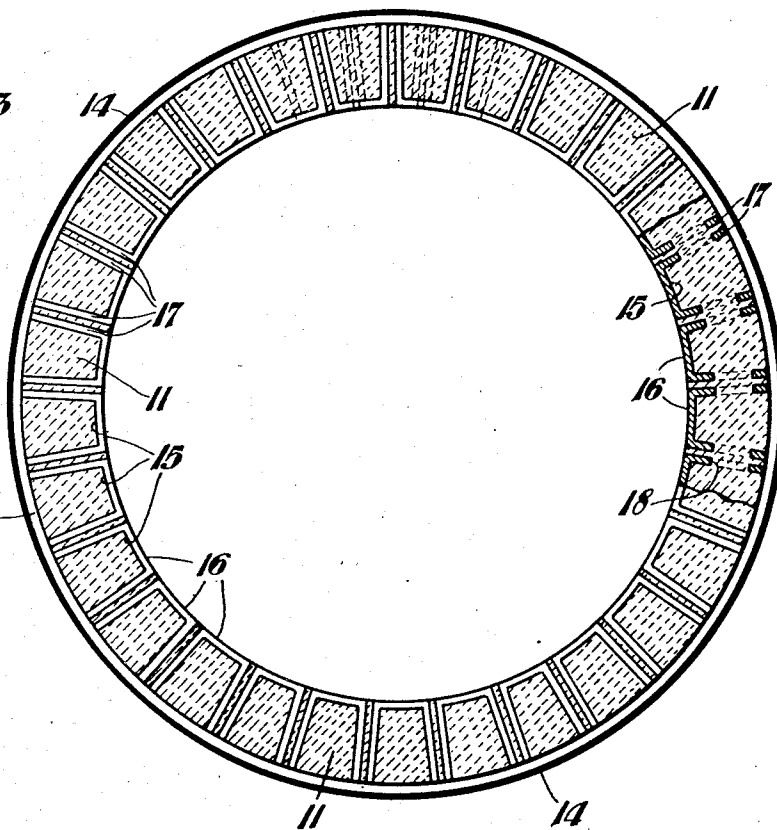


FIG. 3.

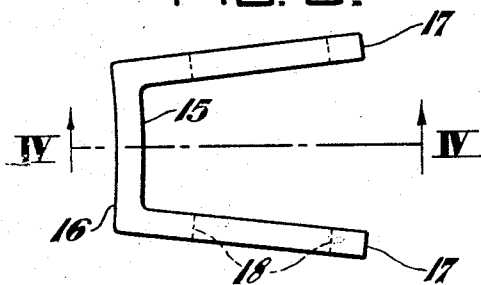
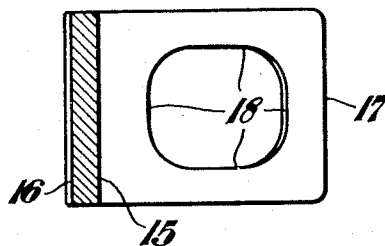


FIG. 4.



Inventor:
HAROLD COPE,
by: *John E. Jackson*
his Attorney.

UNITED STATES PATENT OFFICE

2,148,856

STOCK LINE WEARING ELEMENT

Harold Cope, Monongahela, Pa., assignor to The American Steel and Wire Company of New Jersey, a corporation of New Jersey

Application June 16, 1938, Serial No. 214,096

3 Claims. (Cl. 266—31)

This invention relates specifically to improvements in the stock line zone of a blast furnace of otherwise conventional type, such as used in the manufacture of pig iron.

The specific features of improvement over the prior art will be readily apparent to those familiar with blast furnace construction from an examination of the following detailed description, the accompanying drawing and the appended claims.

In the drawing:

Figure 1 is a vertical, longitudinal section through the stock line zone of a blast furnace;

Figure 2 is a horizontal section thereof on the line II—II of Figure 1;

Figure 3 is a detached detail view of a wear-resisting element constituting an improved article of manufacture adapted to be incorporated in the stock line zone of a blast furnace; and

Figure 4 is a vertical section on line IV—IV of Figure 3.

The present invention is directed to the improvements in the stock line zone of conventional types of blast furnaces such as used in the production of pig iron. It is well known to those skilled in the art that a conventional blast furnace consists of a lower hearth or crucible portion, a bosh thereabove, a shaft portion above the bosh and a stock line portion above the shaft. The stock line portion is subject to constant wear, due to the abrasive action of the charge as it shifts downwardly, and also to the destructive action of the gases which ascend through the furnace. My invention provides improved means for resisting the wear in the critical stock line zone of the furnace, thus prolonging the time interval during which the furnace can be used in pig iron production.

In the embodiment of the invention illustrated the stock line zone of the furnace is indicated generally at 10 and the upper extremity of the stack or shaft position is indicated at 11. Other portions of the furnace are so well known to those skilled in the art that they are not illustrated. The top of the charging platform of the furnace is indicated at 12, and one of the gas off-takes is shown at 13. The furnace may have any suitable or conventional outer steel shell, such as indicated at 14.

In my improved furnace, I provide a multiplicity of circumferentially arranged steel or other metal wear-resisting elements 15 whose upright inner-face portions 16 are preferably, although not necessarily, of arcuate form. Extending outwardly from the face portion of these elements are upright legs 17—17, each of which

is provided with an aperture 18 that the brickwork in the stock line portion may extend therethrough. As best shown in Figure 1, the multiplicity of wear-resisting metal elements are arranged in separate, vertically-spaced courses. Thus, such a multiplicity of metal elements jointly constitutes a substantially or approximately continuous inner wear-resisting facing for the stock line zone of the furnace. The apertured legs of the wear-resisting elements provide means whereby the brickwork may continue or extend in an unbroken manner therethrough. As thus arranged, all parts of each respective member, with the exception of its inner-face portion, is entirely surrounded by and bonded to the brickwork. When the wear-resisting elements are incorporated in the brickwork of the furnace structure in the manner shown and described, it is practically impossible for the same to become warped or distorted. The arrangement is such that the wear-resisting elements expand and contract in every direction with the brickwork, thus constantly keeping intact the bond between the elements and the brickwork.

The arrangement shown and described may be said to provide a non-warpage stock line structure with wall plates incorporated therein which permit a major portion of the brickwork to extend continuously both horizontally and vertically, thus maintaining substantial continuity thereof in those directions. With such a non-warpage stock line construction as above indicated, the wear-resisting elements expand and contract in every direction with the brickwork, thus providing what may be specified as a full floating stock line structure effective to prevent lining cracks.

The advantages which are inherent in the structure which embodies the invention herein disclosed and claimed have been demonstrated by actual reduction to practice.

While I have described quite specifically the embodiment of the invention illustrated, it is to be understood that various modifications may be made without departure therefrom, as defined in the appended claims.

I claim:

1. A blast furnace characterized by a novel stock line zone comprising a multiplicity of wear-resisting elements incorporated in the brickwork, each of said elements having an inner upright lining portion and a pair of upright outwardly extending leg portions apertured to permit a course of brickwork to extend therethrough, thus providing an arrangement wherein the wear-

resisting elements are adapted to expand and contract in every direction with the brickwork and keep intact the bond between said elements and the brickwork.

- 5 2. A blast furnace characterized by a novel stock line zone comprising a multiplicity of circumferentially arranged metallic wear-resisting elements of approximately U-shape as viewed in plan including outwardly extending legs and an
10 inner face portion joining said legs, the legs being of substantially the same height as said face portion, said legs having apertures therein of a size

to permit the brickwork to continue or extend in an unbroken manner therethrough, whereby said elements may expand and contract in every direction with the brickwork.

3. An article of manufacture adapted to be incorporated in the stock line zone of a blast furnace, comprising a metal element having an upright inner face portion and an upright leg portion with an aperture formed therein, which aperture is of a size to permit brickwork of a blast furnace to extend therethrough.

HAROLD COPE.