

Dec. 2, 1941.

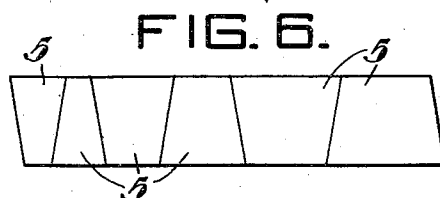
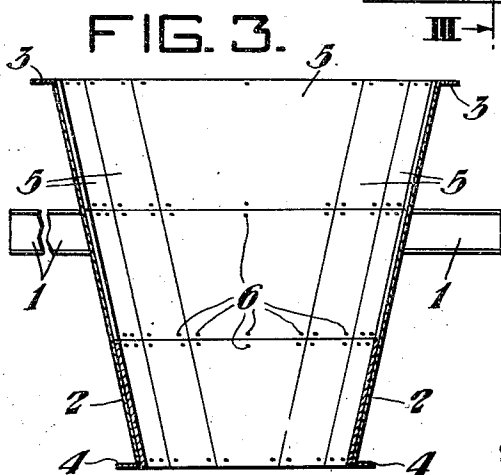
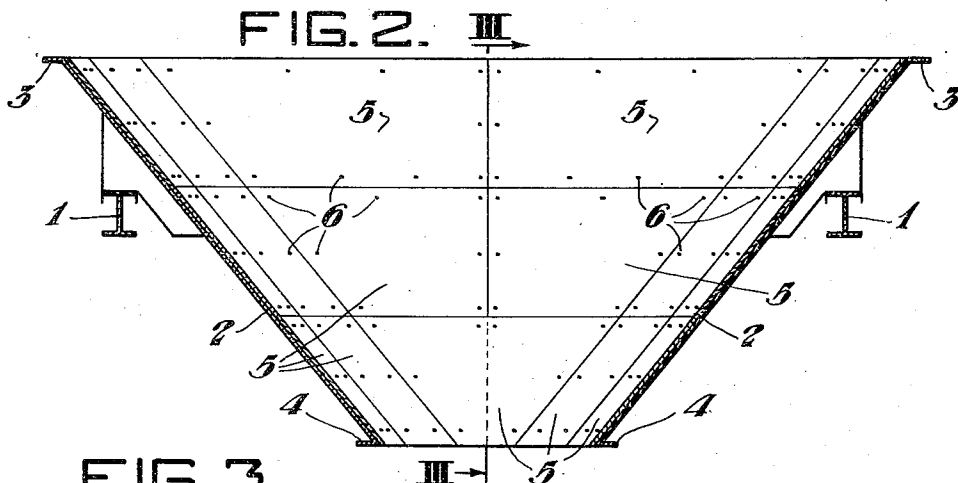
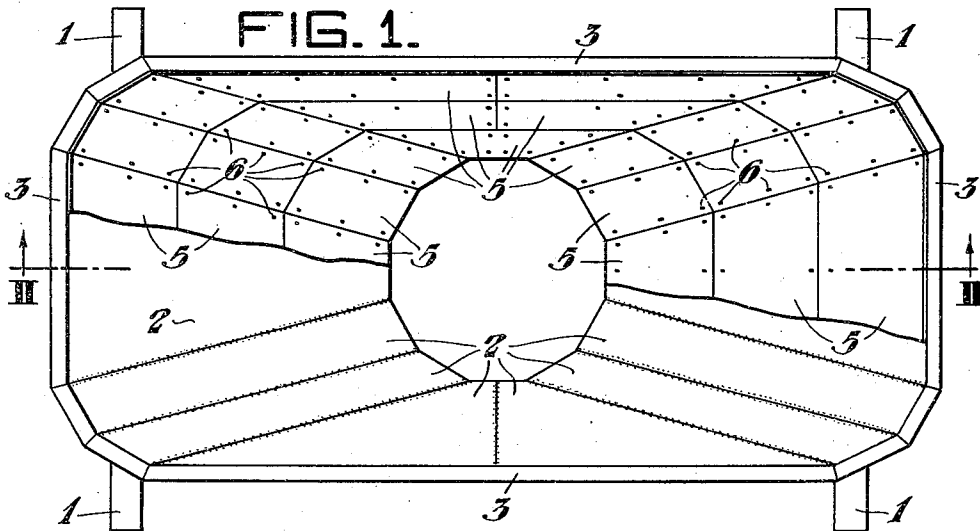
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2,264,423

BLAST FURNACE RECEIVING HOPPER

Filed Aug. 29, 1939

2 Sheets-Sheet 1



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FIG. 4.

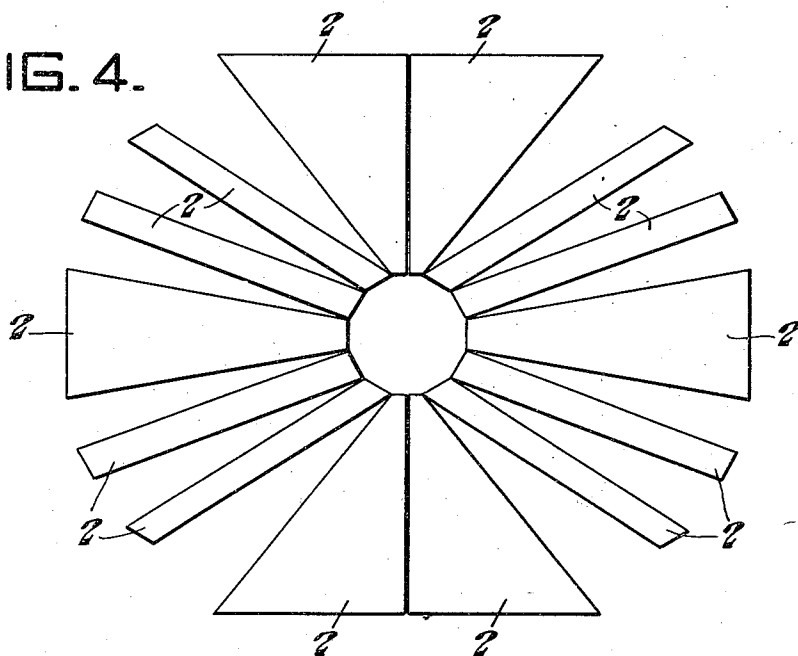
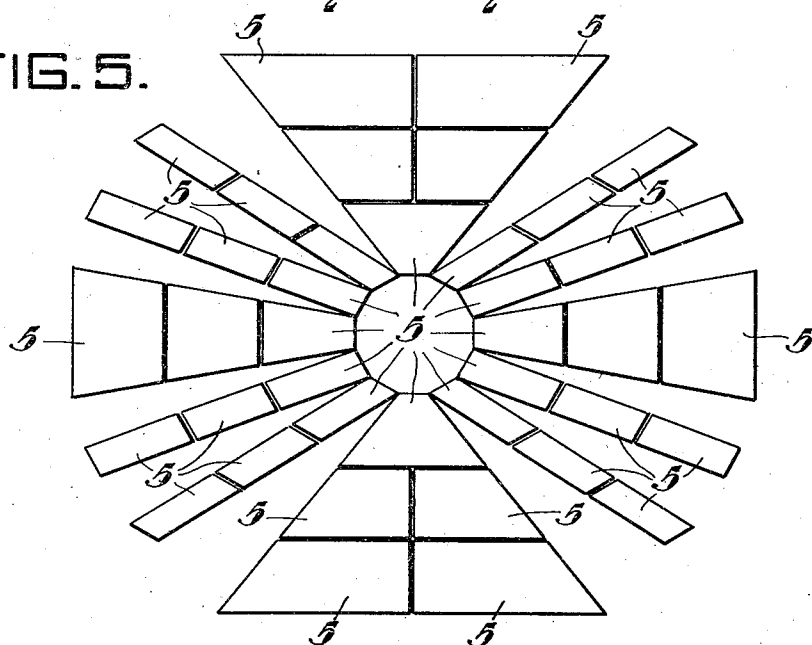


FIG. 5.



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UNITED STATES PATENT OFFICE

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BLAST FURNACE RECEIVING HOPPER

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2 Claims. (Cl. 193—2)

This invention relates to blast furnace receiving hoppers. Such a hopper is used at the top of a blast furnace to receive the charging materials hoisted to this position, the hopper guiding these materials into the little bell.

It is customary to line these hoppers with wearing plates in the form of castings of manganese steel. The casting of these plates requires patterns and the skilled services of foundry workmen. Furthermore, although the patterns may be perfectly made, the castings are subject, while cooling, to warping to such an extent that they cannot be used. It follows that this practice of using these cast manganese steel wearing plates adds considerably to the construction and maintenance costs of a blast furnace.

One of the objects of the present inventor is to construct a blast furnace receiving hopper at less cost than has been heretofore possible and which will have, at the same time, a comparable or superior service life. Furthermore, it is the inventor's desire to enable the construction of such a hopper by less skilled labor than is required in the fabrication and assembly of a hopper lined with the mentioned castings.

A specific example of the invention is illustrated by the accompanying drawings, in which:

Figure 1 is a broken-away plan;

Figure 2 is a section from the line II—II in Figure 1;

Figure 3 is a section from the line III—III in Figure 2, and

Figures 4 through 6 are construction layouts or patterns.

More specifically, these drawings show a blast furnace receiving shell supported in proper position by a framework 1, this shell being made of flat, rolled steel plates 2 in a polygonal shape, free from curved plane surfaces and with a multiplicity of flat plane surfaces, provided by the plates 2, forming its contour. In other words, the shell does not provide curved surfaces requiring the services of highly skilled boilermakers for its construction.

The plates 2 are cut so that when laid on a flat surface they form the pattern shown by Figure 4. When the adjacent edges of these various plates 2 are brought into abutting relation they form the hopper shell described, the abutting edges being interwelded with their upper and lower ends, respectively, welded to top and bottom flanges 3 and 4. The attachment of the shell to the framework 1 may be effected in any convenient manner that is sufficiently sturdy.

The wearing plates are made from flat rolled, abrasive resistant steel instead of being cast in the manner of the prior art. These wearing

plates are in the form of a plurality of segments 5, each of the plates 2 mounting a plurality of these segments 5 along its length, the plates 2 and the segments or wearing plates 5 being provided with mutually registering apertures 6 through which fasteners may be passed to removably fix the wearing plates in position.

As shown by Figures 5 and 6, the plates are cut from the flat rolled product so that when assembled they provide a pattern corresponding to that shown by Figure 5, fastening of the wearing plates 5 to the plates 2 providing a lining of wearing plates completely protecting the shell of the hopper against abrasion.

The reason the plates 5 are made in the form of relatively small segments is so that they may be cut from a relatively narrow strip of flat rolled, abrasive resistant steel, Figure 6 indicating how they may be cut from such a narrow strip. It is to be understood that this is not thin gaged strip but is a relatively heavy gaged product which might just as appropriately be called narrow plate.

Here again, it is to be observed that no bending is required, the wearing plates 5 all being flat. The fitting and fastening of these plates to the plates 2 comprising the hopper shell, does not require highly skilled labor. Furthermore, the fabrication of the plates 5, it being understood that these must be replaced as wear destroys their usefulness, is an operation requiring only reasonably skilled workmen, it being unnecessary to work to extremely close tolerances other than is normally required in the fabrication of structural steel parts. The wearing plates may be cut from the flat rolled, abrasive resistant product by any convenient means at hand.

I claim:

1. A blast furnace receiving hopper having wearing plates formed from flat rolled, abrasive resistant steel, said hopper being of polygonal shape, free from curved plane surfaces and with a multiplicity of flat plane surfaces forming its contour, said plates being flat and fitted onto said surfaces so they can be fabricated by appropriately cutting the flat steel from which they are formed.

2. A blast furnace receiving hopper having wearing plates formed from flat, abrasive resistant steel, said hopper being of polygonal shape, free from curved plane surfaces and with a multiplicity of flat plane surfaces forming its contour, said plates being flat and fitted on said surfaces so they can be fabricated by appropriately shaping the flat steel from which they are formed.

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