

Feb. 2, 1926.

H. S. KNIGHT

1,571,675

GRATE BAR FOR PULVERIZING MACHINES

Filed Feb. 21, 1925

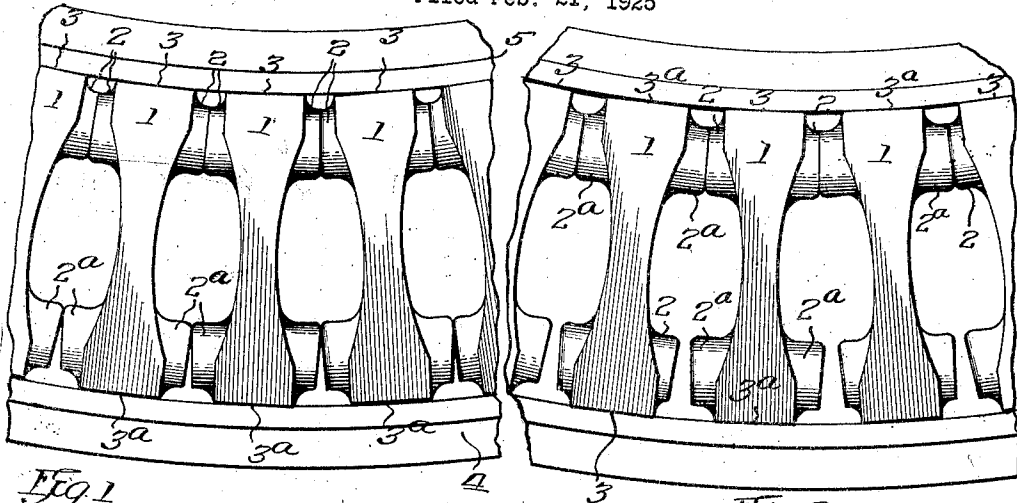


Fig. 1

Fig. 2

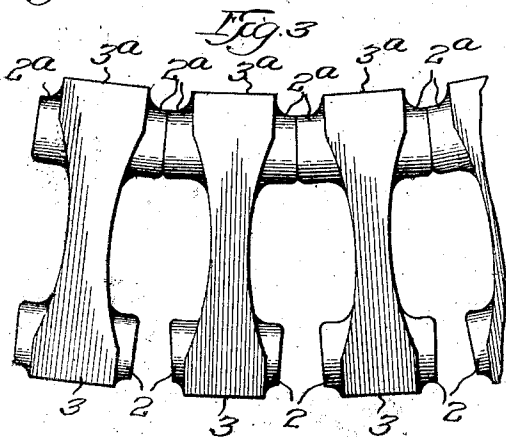


Fig. 3

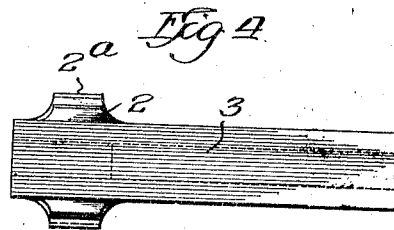


Fig. 4

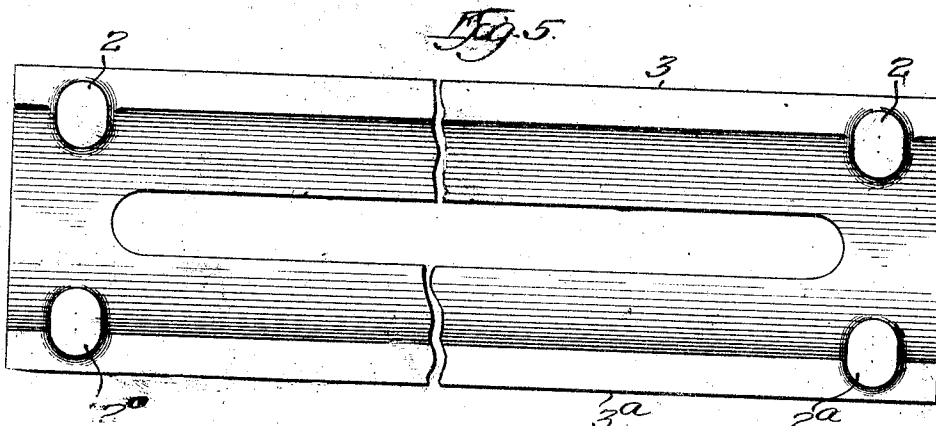


Fig. 5

Witness:

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By Wilkins & Layton, Attys.

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UNITED STATES PATENT OFFICE.

HERVEY S. KNIGHT, OF EVANSTON, ILLINOIS, ASSIGNOR TO AMERICAN MANGANESE STEEL COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF MAINE.

GRATE BAR FOR PULVERIZING MACHINES.

Application filed February 21, 1925; Serial No. 10,731.

To all whom it may concern:

Be it known that I, HERVEY S. KNIGHT, a citizen of the United States, residing at Evanston, in the county of Cook and State of Illinois, have invented certain new and useful improvements in Grate Bars for Pulverizing Machines, of which the following is a specification.

This invention relates to bars which are employed in suitable numbers to develop a grating which serves as a supporting and reducing surface for mineral substances while being acted upon by rotary hammers or other forms of reducing elements.

Among the objects of the present invention are to provide a form of grate bar which will adapt a plurality thereof to be assembled in the grating in several different relations, each of which establishes a different spacing of the bars and corresponding grading of the material permitted to pass through the grating; also to provide a form of grate bar which, while serving the object first named, will also serve the purpose of affording two different wearing surfaces for presentation, in supporting relation to the material to be reduced, namely, by inverting the bars about their longitudinal axes; also to adapt grate bars, while serving the first and second objects named, to be associated each with any other bar in either of its own two positions, or in either of the two positions which the other bar is adapted to assume; also to provide a form of grate bar which, while serving all of the aforesaid purposes, is well adapted for economical production in the foundry, of material such as manganese steel which, while well suited for use in situations involving highly abrasive influences, requires a resort to grinding for such finishing operations as the castings may require.

In carrying out the invention, bars of suitable dimensions to bridge the space between supporting elements of a pulverizing machine, or other apparatus where grate bars are used, are provided on their lower as well as their upper marginal portions with faces adapted to receive and support the material that is to be acted upon, and these marginal portions are each provided on opposite sides thereof with spacing lugs which, when in upper position, will meet the spacing lugs on the upper portions of adjacent grate bars and determine the spac-

ing of the grate; and the lugs on the respective marginal portions of the bars are of different depth so that if two bars are positioned with their shortest lugs in abutment, the minimum spacing between said bars will result; when one bar has its shorter lugs in the upper position and another bar has its longer lugs in abutment thereagainst, an intermediate spacing will result; and when two bars both have their longer lugs uppermost, the maximum spacing will result.

In the accompanying drawing—

Figures 1, 2, and 3 are end views each showing a plurality of grate bars in relative positions which they assume in use, and with the bars selectively spaced to develop, in the respective views, the maximum, the intermediate, and the minimum spacing.

Figure 4 is a plan view of one end of a grate bar that is typical of those illustrated in Figures 1, 2, and 3, and

Figure 5 is a side view of the same.

1 represents a series of grate bars positioned in Figures 1, 2, and 3 in the relations which they are intended to assume in making up a grating upon which material is supported while being reduced, physically, and through which the material is intended to pass when it reaches a predetermined degree of reduction. The bars 1 are spaced apart by lugs 2 which abut together so that their combined dimensions define the spacing between the bars, when the supporting faces 3 of the bars are in position to constitute the surface of the grate. It is customary to support bars in service by confining them between a lower supporting ledge 4 and an upper confining ledge 5 (Figure 1), between which ledges the bars may fit with sufficient snugness to resist tipping of the bars in case they are in abutment only at their upper ends, and notwithstanding the support may be of arcuate form and extend to such portion of a circle as approximates the vertical at one or both ends of the grate.

According to the present invention, each bar 1 has its marginal portion 3^a, as well as the portion 3, designed to enter into and form a part of the supporting surface of the grate; and in order that the bars may be properly spaced, with the marginal portions 3^a presented upwardly, the bars are provided with additional lugs 2^a adjacent

the marginal portions 3^a. The abutting faces of the lugs 2, as well as of the lugs 2^a, will preferably be constructed on radii of the arc of the supporting ledge 4 and confining ledge 5. According to Figure 1, the bars are all in position which brings their shorter lugs 2 into abutment, thereby defining the minimum spacing of the bars. In Figure 2, each alternate bar has been inverted to bring its marginal portion 3^a, together with the longer lugs 2^a, uppermost so that the latter, entering into abutment with the short lugs 2, define a spacing measured by the sum of a short and a long lug and, therefore, of intermediate width. In Figure 3, the bars are all positioned with their ends 3^a and longer lugs 2^a uppermost, with the result that the spacing of the bars is defined by the sum of two long lugs, and is, therefore, the maximum that can be obtained.

From the foregoing description, it will be seen that each grate bar is given a double life by reason of having two different faces adapted to be brought into the surface of the grate, and, by selectively positioning the bars, three different spacings may be obtained.

I claim:

1. A grate bar, constructed with two load-bearing marginal portions extending lon-

gitudinally of the bar, and spacing lugs associated with each marginal portion so that the bars may be supported in either of two positions; the lugs at opposite marginal portions being of different length.

2. A grate bar, constructed with two load-bearing marginal portions extending longitudinally of the bar, and spacing lugs associated with each marginal portion so that the bars may be supported in either of two positions; the lugs at opposite marginal portions being of different length; and a lug on each marginal portion of a bar, when the marginal portion is presented at the surface of the grate, being adapted to abut against either of the lugs on an adjacent bar presented in said position.

3. Grate bars adapted to be assembled to form a grating, each of which has longitudinal marginal portions constructed for presentation at the surface of the grating, and each of which has spacing lugs adjacent its respective marginal portions, said lugs being of different length; a long lug on one bar, when in said position, being adapted to enter into abutment with either the long lug or the short lug of an adjacent bar similarly positioned.

Signed at Chicago, Illinois, this 12th day of February, 1925.

HERVEY S. KNIGHT.