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H. W. IRWIN

ROTARY PAIR FURNACE FOR SHEET MILLS

Filed June 23 1923

2 Sheets-Sheet 1

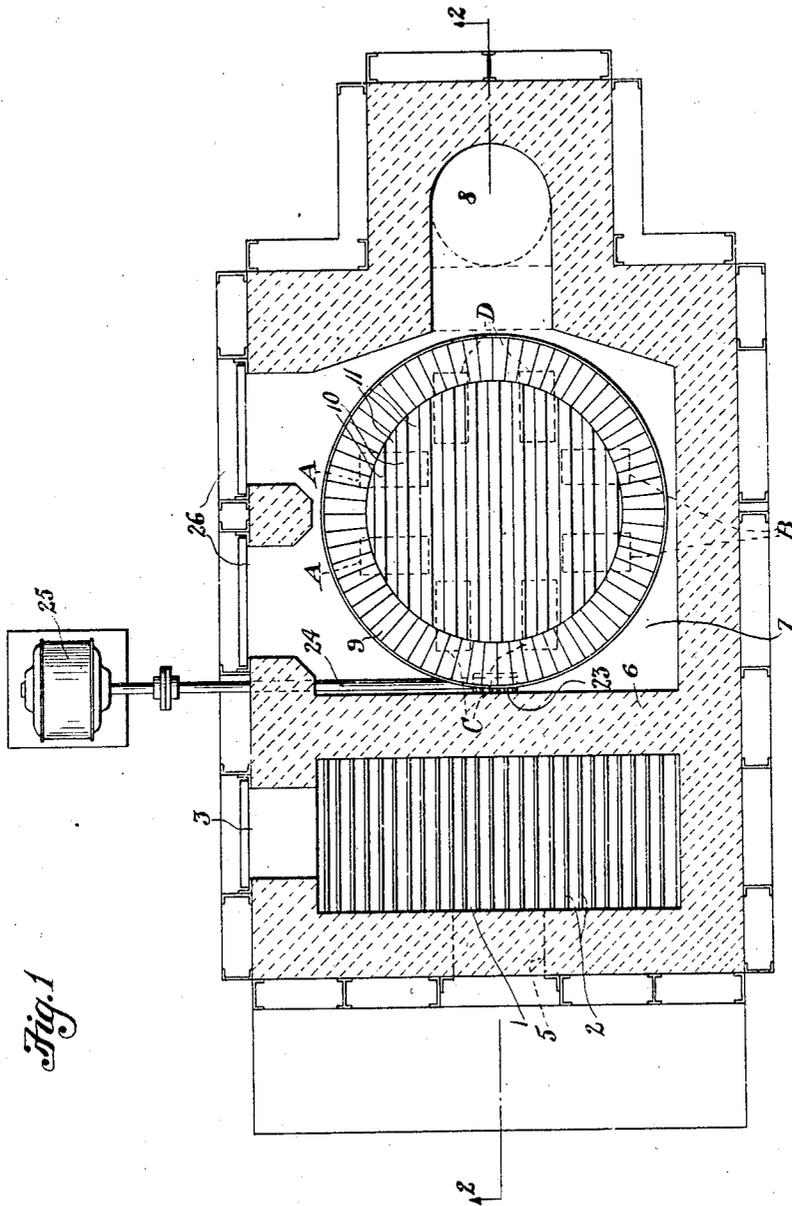


Fig. 1

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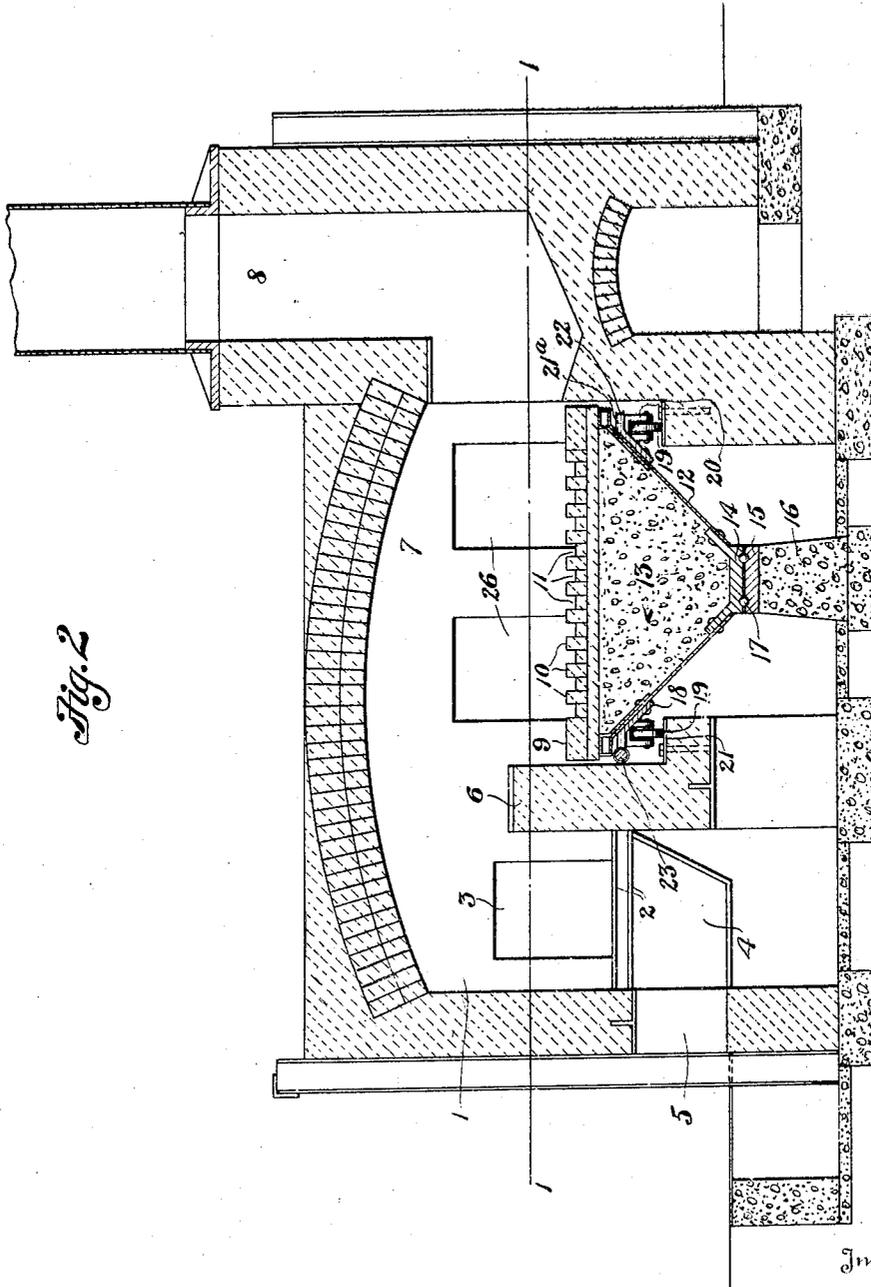
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2 Sheets-Sheet 2



*Fig. 2*

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# UNITED STATES PATENT OFFICE.

HARRY W. IRWIN, OF CANTON, OHIO.

ROTARY PAIR FURNACE FOR SHEET MILLS.

Application filed June 23, 1923. Serial No. 647,228.

*To all whom it may concern:*

Be it known that I, HARRY W. IRWIN, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Rotary Pair Furnaces for Sheet Mills, of which the following is a specification.

The invention relates to pair furnaces for sheet mills, and particularly to furnaces of this general character provided with a rotary hearth upon which the pairs to be heated are charged.

The objects of the invention are to provide a furnace of this character in which the apparatus can be heated less expensively and with less fuel than in the ordinary construction of furnaces and which eliminates the formation of scale upon the pair bars which would otherwise be usually formed during the heating operation.

The above and other objects are attained by constructing the furnace in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a plan section of the improved furnace taken on the line 1—1, Fig. 2; and Fig. 2, a section on the line 2—2, Fig. 1, the hearth being rotated a quarter turn to illustrate the grooves therein.

Similar numerals refer to similar parts throughout the drawings.

The furnace comprises the combustion chamber 1 provided with the grate bars 2, upon which the fire is supported, a fire door 3 being provided at one end of the grate in order that the fire may be raked evenly lengthwise of the grate and crosswise of the grate bars. An ash pit, as shown at 4, is provided beneath the grate, access being had to the same through the ash door 5.

A bridge wall 6 is preferably provided between the combustion chamber and the heating chamber 7, the stack 8 communicating with the heating chamber upon the side thereof opposite to the combustion chamber, in order to carry the flame through the combustion chamber and over the pair bars therein in the usual manner.

The circular hearth of the furnace, which is located in the heating chamber, between

the bridge wall 6 and the stack, is indicated generally at 9 and is formed of fire brick, alternate rows of which are raised as at 10, forming the spaced, parallel grooves 11 extending across the hearth.

This hearth is supported upon a conical shell 12, preferably formed of boiler plate and filled with concrete or the like, as shown at 13, for the purpose of reinforcing the same. The lower end of this conical shell is connected to the cast iron ball race 14 which cooperates with a similar ball race 15 supported upon the foundation block 16. steel balls 17 being contained between said ball races in order that the hearth may be easily rotated.

A cast ring 18 is connected around the upper portion of the conical shell 12, and rollers 19 are journaled in brackets 20 supported upon said ring, the rollers engaging the annular track 21. The ring 18 is provided with an outturned annular flange 21<sup>a</sup> having teeth cut around the periphery thereof as at 22, forming a worm gear which meshes with the worm 23 upon the shaft 24 which is operatively connected to a motor 25 or other suitable source of power.

In charging the furnace, the pair bars as shown in dotted lines at A in Fig. 1, are placed through the charging doors 26, being laid across the grooves 11 of the hearth as shown. The hearth is then given a half turn, bringing the pair bars into the position shown at B in dotted lines in Fig. 1.

It will thus be seen that the flames and gases will pass both over and under the pair bars, the grooves permitting them to pass beneath the pair bars. Pair bars may also be placed in the positions shown at C and D in dotted lines in Fig. 1, by giving the hearth a quarter turn after charging the same.

With this furnace, it will be seen that each charge of pair bars will remain in the furnace for a considerable length of time and may thus be brought to the proper temperature without the necessity of keeping the temperature of the heating chamber as high as is ordinarily done where the pair bars are kept in the furnace a very short time.

By thus keeping the heating chamber at

a lower temperature and permitting the pair bars to remain in the heating chamber a greater length of time, the pair bars are heated to the desired temperature before  
5 being withdrawn from the furnace, and the possibility of scale forming upon the pair bars is eliminated.

I claim:

A pair bar heating furnace having a heating chamber, a rotatable hearth therein, the hearth having spaced parallel grooves in its surface across which the pair bars are adapted  
10 to be laid.

HARRY W. IRWIN.