(No Model.) 2 Sheets—Sheet 1.

E. J. GORDON.

BLAST PIPE FOR FURNACE GRATES.

No. 491,549. Patented Feb. 14, 1893.

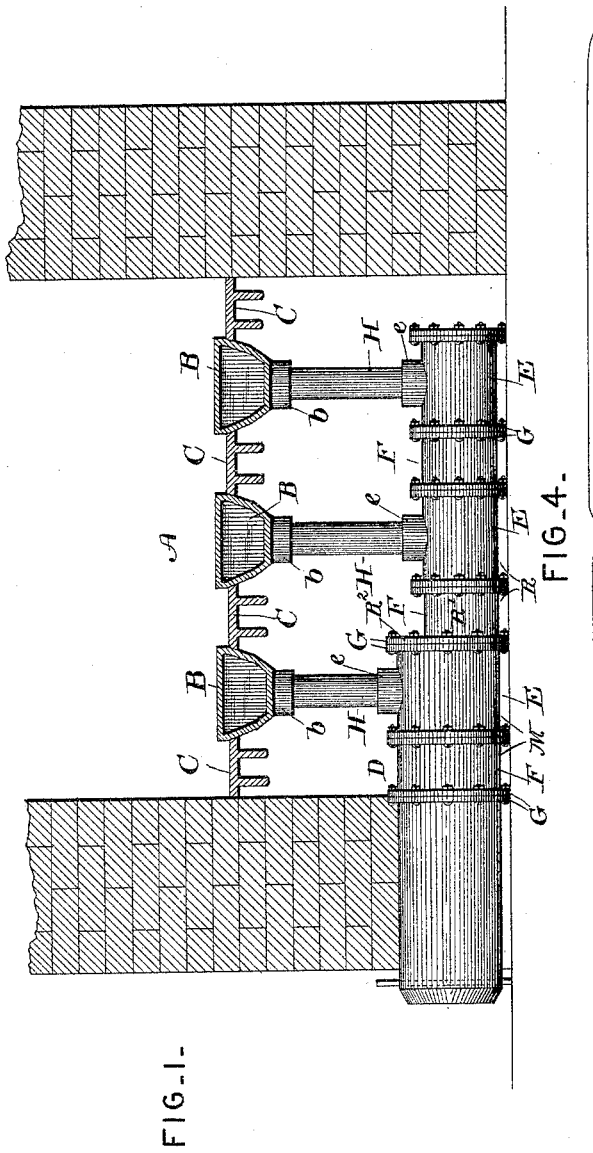

FIG. 1.

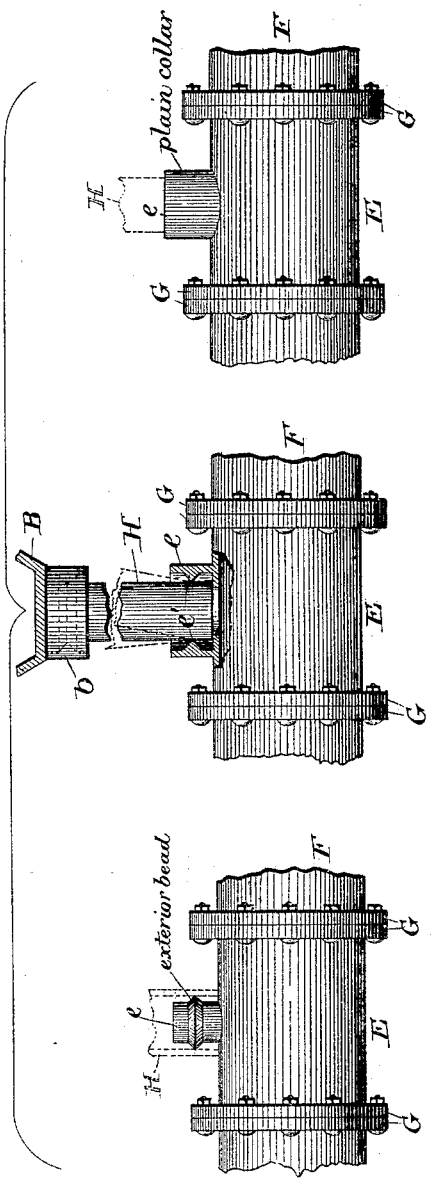

FIG. 4.

Witnesses

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(No Model.) 2 Sheets—Sheet 2.

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FIG. 2.

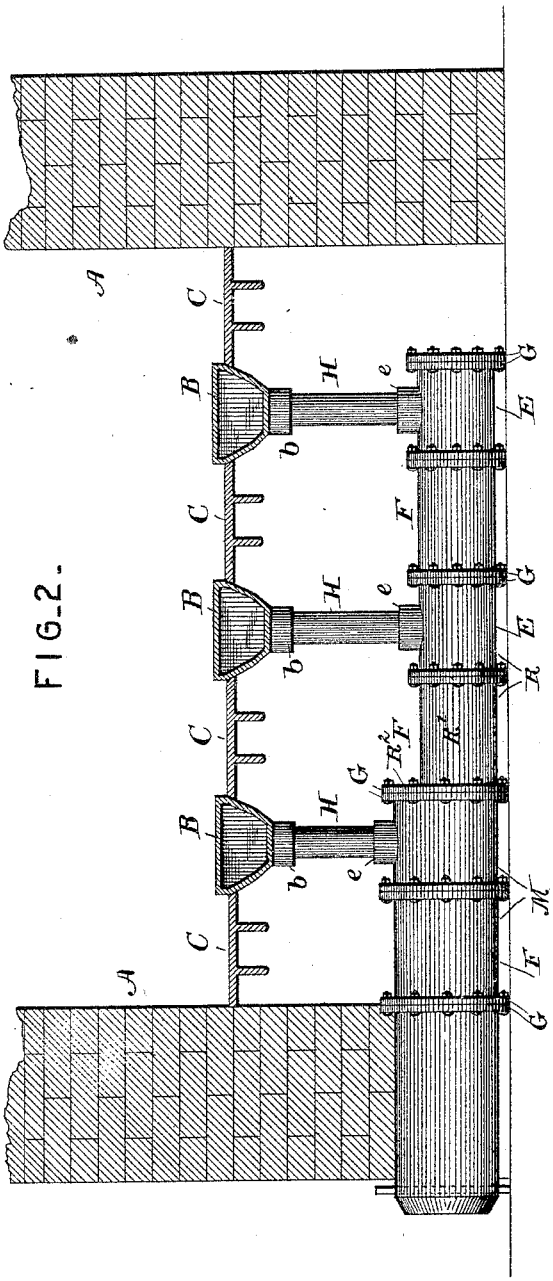
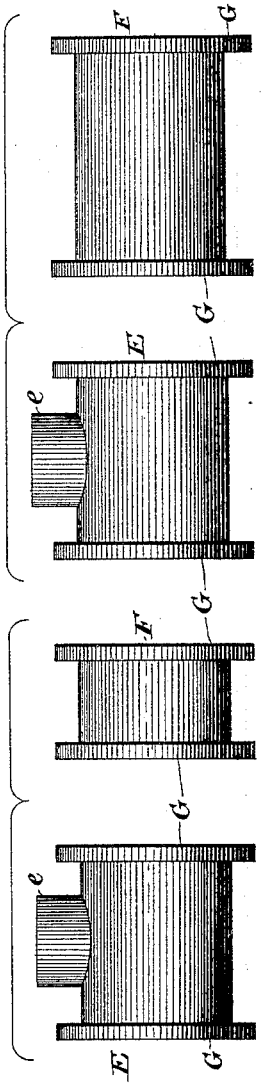


FIG. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

ELONSO J. GORDON, OF GREENVILLE, MICHIGAN.

BLAST-PIPE FOR FURNACE-GRATES.

SPECIFICATION forming part of Letters Patent No. 491,549, dated February 14, 1893.

Application filed September 26, 1892. Serial No. 446,908. (No model.)

To all whom it may concern:

Be it known that I, ELONSO J. GORDON, a citizen of the United States, residing at Greenville, in the county of Montcalm and State of Michigan, have invented a new and useful Blast-Pipe for Furnace-Grates, of which the following is a specification.

This invention relates to blast pipes for furnace grates; and it has for its object to provide an improved construction of blast pipe adapted to be connected with the blast grate bars of a furnace grate, which construction not only provides means for the ready setting up of the blast pipe to accommodate various widths of grates, but also provides means whereby any particular part of the blast pipe can be repaired without disturbing the other parts.

With these and many other objects in view which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

In the accompanying drawings:—Figure 1 is a vertical sectional view of a furnace grate having a blast pipe connected therewith and constructed in accordance with this invention. Fig. 2 is a similar view illustrating the blast pipe as adapted to a different width of grate than that illustrated in Fig. 1. Fig. 3 is a detail elevation showing a detached group of T and plain sections of pipe. Fig. 4 is an enlarged detail elevation partly in section of a section of the blast pipe, illustrating the different connections therewith.

Referring to the accompanying drawings:—A represents a furnace grate comprising the alternately arranged series of hollow blast grate bars B, and the intermediate closed or draft grates C separating and spacing said blast grate bars. It will be apparent that in placing a grate of this construction into furnaces already built, that the width of the grates must necessarily differ according to the size of the furnace, and also that any number of hollow blast grate bars may be employed according to the fuel used, or to the draft, or blast requirements of the particular furnace. With this in mind it will be apparent that it will be necessary to have blast conducting devices which accompany the grate as a part thereof, and which can be correspondingly made to be accommodated to any width of grate according to the size of furnace in which the same is employed.

The blast pipe D illustrated in Figs. 1 and 2 comprises a series of alternate flanged T-sections of pipe E, and intermediate plain sections F, connecting and spacing the alternate T-sections. Both the "T" and plain sections of pipe, composing the main sectional blast pipe D, have circular end flanges G which abut and are suitably clamped together by means of bolts, preferably, in order that the entire device can be easily set up originally, or anyone of the sections thereof removed or replaced by a new section if it should be necessary. Connecting pipes H. connect the alternate T-sections of the blast pipe to the hollow grate bar lying directly thereover, as is clearly illustrated.

In constructing the hollow grate bars which are always of a uniform width, the T-sections, E, of the sectional blast pipe are at the same time constructed in a length equal to the width of such hollow grate bars, and are therefore themselves always of a uniform length, and are designed to accompany the hollow grate bars of a width equal to such lengths of pipe. Now, as before set forth, it is apparent that some grates have more hollow grate bars than other grates, and therefore the intermediate draft or other grates C, must necessarily vary in their widths, while the said hollow grate bars are always of the same width. Therefore, as the T-sections of the blast pipe are arranged directly under the hollow grate bars to which they are connected so as to allow the pipes H to be readily connected therewith and to the grate bars, it will be seen that the intermediate plain sections of piping must also vary in length to correspond with the width of the varying intermediate grate bars, and thereby accommodate the sectional blast pipe to the varying widths of grates.

From the foregoing description, the many advantages attendant upon constructing a sectional blast pipe which has the component parts thereof correspond in length to the width of the component parts of the grate, so that the same form parts of a single apparatus which can be readily set up in any

furnace, will be apparent to those skilled in the art.

In Fig. 4 of the drawings is illustrated the preferred and modified forms of the connection of the vertical pipes H with the T-sections E and also with the hollow grate bars B. As illustrated in this figure of the drawings the T-sections E, are each provided with the coupling collars *e*, having the interior raised angular annular coupling beads *e'*, which are designed to bite the lower ends of the vertical connecting pipes H, which are inserted within said coupling collars, while the upper ends thereof are received by the collars *b* of the grate bars B, which may or may not be provided with similar beads. Now, as illustrated in dotted lines, it will be seen that while this raised bead or coupling annulus holds the vertical pipe in tight connection therewith, it at the same time allows the said pipe to vary somewhat from the perpendicular without injury thereto, or the impairment of the joint which should be practically air-tight. This is rendered necessary by the unavoidable contraction and expansion of the grate surface above. The other forms illustrated in this figure show the coupling collars with an exterior bead and without a bead, respectively, such forms being used if found necessary, but the first form described is preferably employed inasmuch as the outside diameter of boiler tubing, of which the pipes H are made, is much more uniform than the inside diameter of the same and are therefore more readily fitted into an interior coupling as described. Further, from a practical stand point, inasmuch as the alternating draft grates are of all widths, and as a consequence, the plain sections of pipe F vary with almost every grate on account of the different sizes of furnaces, it follows that it is essential, and of much advantage, that the T-sections of the blast pipe are uniformly the same so as to require only the plain sections to be varied according to the width of grate, whereas on the other hand it would be necessary to provide patterns for all sections of the pipe according to the size of every single grate, and therefore destroy one of the greatest advantages of the present grate, that is, its shipment as a single apparatus ready to be set up in any furnace whose size has been previously given to the grate manufacturer.

By reference to Figs. 1 and 2 of the drawings, it will be observed that the blast pipe D further comprises a main blast section M and a smaller diameter blast reducing section R, forming a continuation thereof to secure the proper distribution and intensity of the blast. As illustrated the end T-section of the main blast section is provided with the described end flanges G, of the same diameter, while the plain section of the reducing portion or section of the blast pipe connected to such T-section, and lettered R', is further provided at one end with an enlarged circular end flange R^2, which is of the same diameter as the end flanges of the larger T-sections, to one of which flanges said enlarged flange is bolted. Some plain sections of pipe are therefore manufactured in proper sizes to provide for the reducing of the blast, and are constructed with enlarged end flanges to provide for the proper connections.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:—

1. In combination with a grate composed of hollow blast grate bars and other grate bars placed alternately, a sectional blast pipe comprising alternate T-sections and plain sections removably connected together, said T-sections being arranged directly under the hollow blast grate bars and made of uniform lengths equal to the width of the hollow blast grate bars directly thereover, and connections from each T-section to a hollow blast grate bar, substantially as set forth.

2. In combination with the hollow grate bars of a blast grate having depending receiving collars; the main blast pipe having collars or T-sections provided with interior annular coupling beads, and the vertical connecting pipes received by said collars, substantially as set forth.

3. In combination with the hollow grate bars of a blast grate; the main blast pipe comprising alternate T and plain sections having circular end flanges and aligned in sections of two diameters to reduce the blast, the end plain section of pipe of the smaller or reducing section being further provided with an enlarged end flange of the same diameter as the end flange of the larger T-section coupled thereto, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ELONSO J. GORDON.

Witnesses:
A. C. PHELPS,
W. M. CONOVER.