(No Model.)

G. S. GILBERT.

ATTACHMENT FOR BOILER FURNACES.

No. 283,338. Patented Aug. 14, 1883.

FIG I.

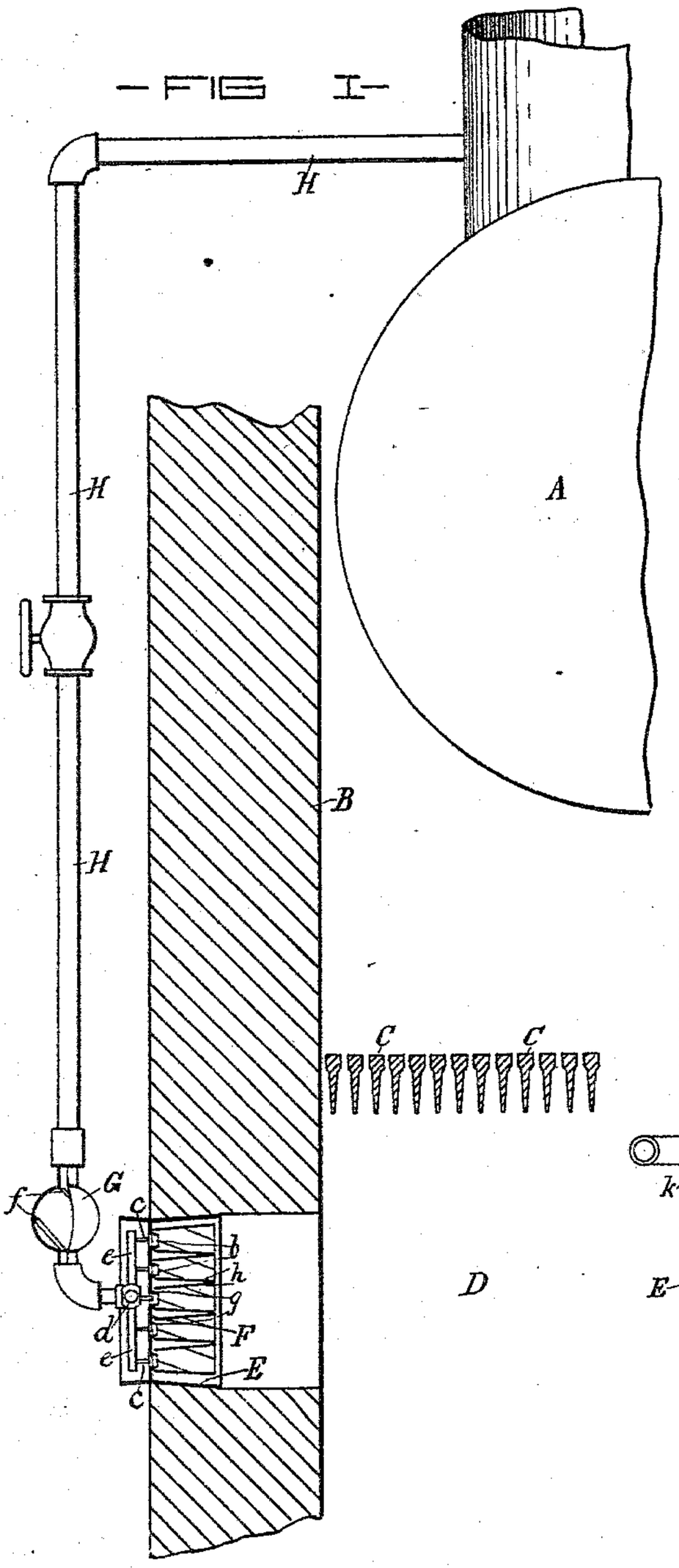


FIG II.

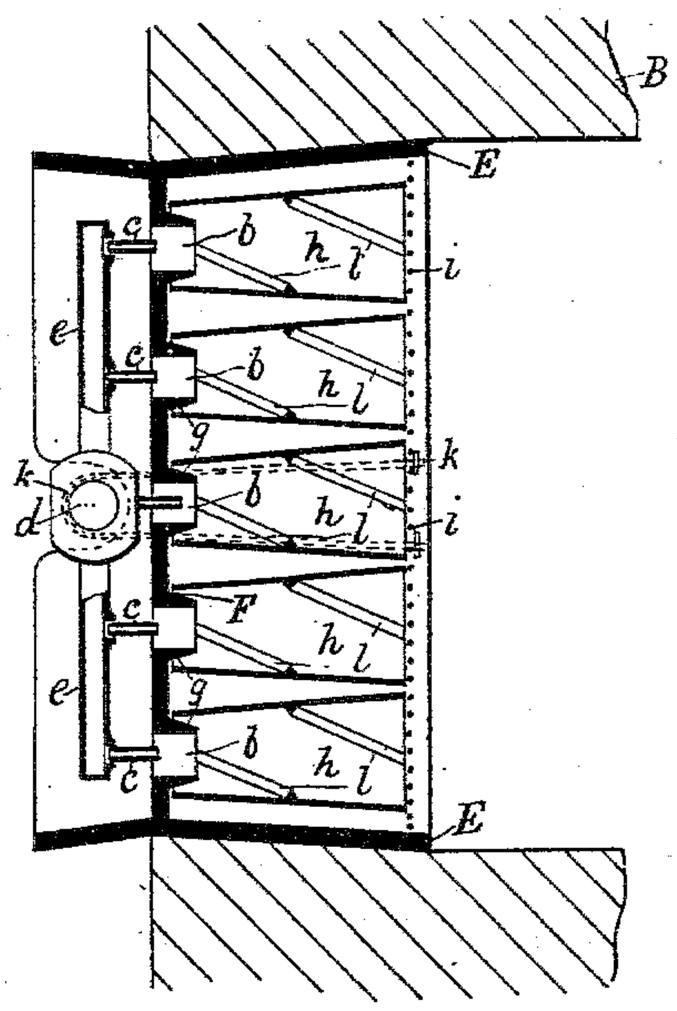
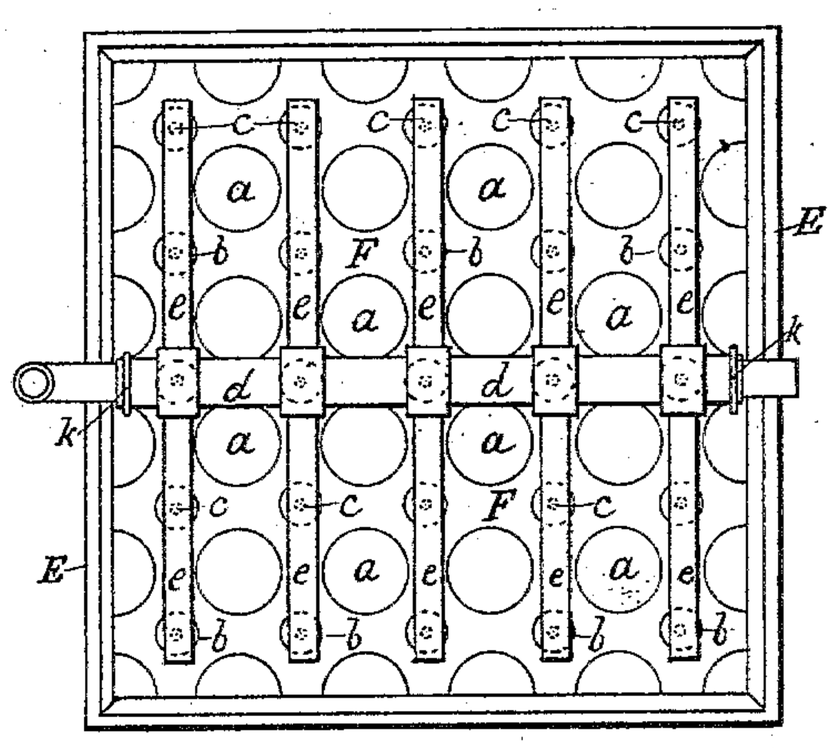


FIG III.



WITNESSES

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ATTACHMENT FOR BOILER-FURNACES.

SPECIFICATION forming part of Letters Patent No. 283,338, dated August 14, 1883.

Application filed January 15, 1883. (No model.)

To all whom it may concern:

Be it known that I, GEORGE S. GILBERT, of the city of Baltimore, and State of Maryland, have invented certain Improvements in Attachments for Boiler-Furnaces, of which the following is a specification.

This invention relates to a device to be applied to a practically-closed ash-pit of a boiler-furnace, to conduct hot air and steam under pressure and with a whirling movement to, underneath, and between the grate-bars, for the purposes hereinafter described.

In the further description of the invention which follows reference is made to the accompanying drawings, forming a part hereof, and in which—

Figure I is a sectional view of a part of a steam-boiler and the side wall and other portions of the furnace provided with my improvements. Fig. II is a vertical section of the invention on an enlarged scale. Fig. III is a front view of a part of the improvement on an enlarged scale.

Similar letters of reference indicate similar parts in all the views.

A is the shell of the boiler, and B one of the side walls of the furnace. C C are the grate-bars, and D is the closed ash-pit or space below the grate-bars. E is a frame built in the wall B, and F a plate cast or secured within the said frame. The plate F has holes or openings *a* for the admission of air to the ash-pit, and others, *b*, through which steam is ejected from a series of nozzles, *c*, which extend from the central and branch steam-pipes, (respectively denoted by *d* and *e*.) The central steam-pipe, *d*, is supported across the outer edge of the frame E, and is closed at one end. The other end of the pipe *d* is attached to a globe, G, to which the steam-pipe H, leading from the steam-room of the boiler, is attached. The globe G is provided with an internal thread or spiral projection, *f*, to give a circular or rotative motion to steam passing through it. This rotative movement of the steam is continued after it escapes from the nozzles *c*, notwithstanding that the said nozzles are much smaller in diameter than the interior of the globe or any of the pipes between it and the said nozzles. The holes *b*, which are considerably larger than the nozzles *c*, have a projecting flange, *g*, around them over which conical tubes *h* are placed. The conical tubes *h* are confined in position by means of a piece of wire-work, *i*, and staples *k*. Steam ejected from the nozzles *c* into the closed ash-pit D causes the rapid entrance of air through the openings *b* and conical pipes *h*, and as the latter devices are provided with an internal thread or a spiral, *l*, similar to the spiral used in the globe G, the air receives a rotative movement as well as the steam. The result of this peculiar movement of the air and steam is that the whole ash-pit is filled with a whirling column of combined hot air and steam of greater force than if supplied as ordinarily, and which not only supplies the necessary oxygen to the burning mass of fuel in the furnace, and also to consume the gases, soot, and cinders, but prevents the falling of small particles of coal from the spaces between the grate-bars.

The ash-pit is rendered practically closed by means of doors of the usual description, and which are not represented in the drawings.

It will be seen that the great difference in size of the nozzles *c* and the holes *b* allows of considerable adjustment of the said nozzles. Consequently the air and steam can be directed toward any point in the furnace within reasonable limits.

I claim as my invention—

In combination with the wall of a closed furnace ash-pit, an open frame secured within the said wall, a plate fastened within the said frame, having openings for the admission of air to the said ash-pit, and other openings surrounded by outwardly-flaring pipes having an interior thread or spiral, and steam-nozzles to conduct a jet of steam to the interior of the said flaring threaded tubes, substantially as and for the purpose specified.

GEO. S. GILBERT.

Witnesses:
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