

No. 732,909.

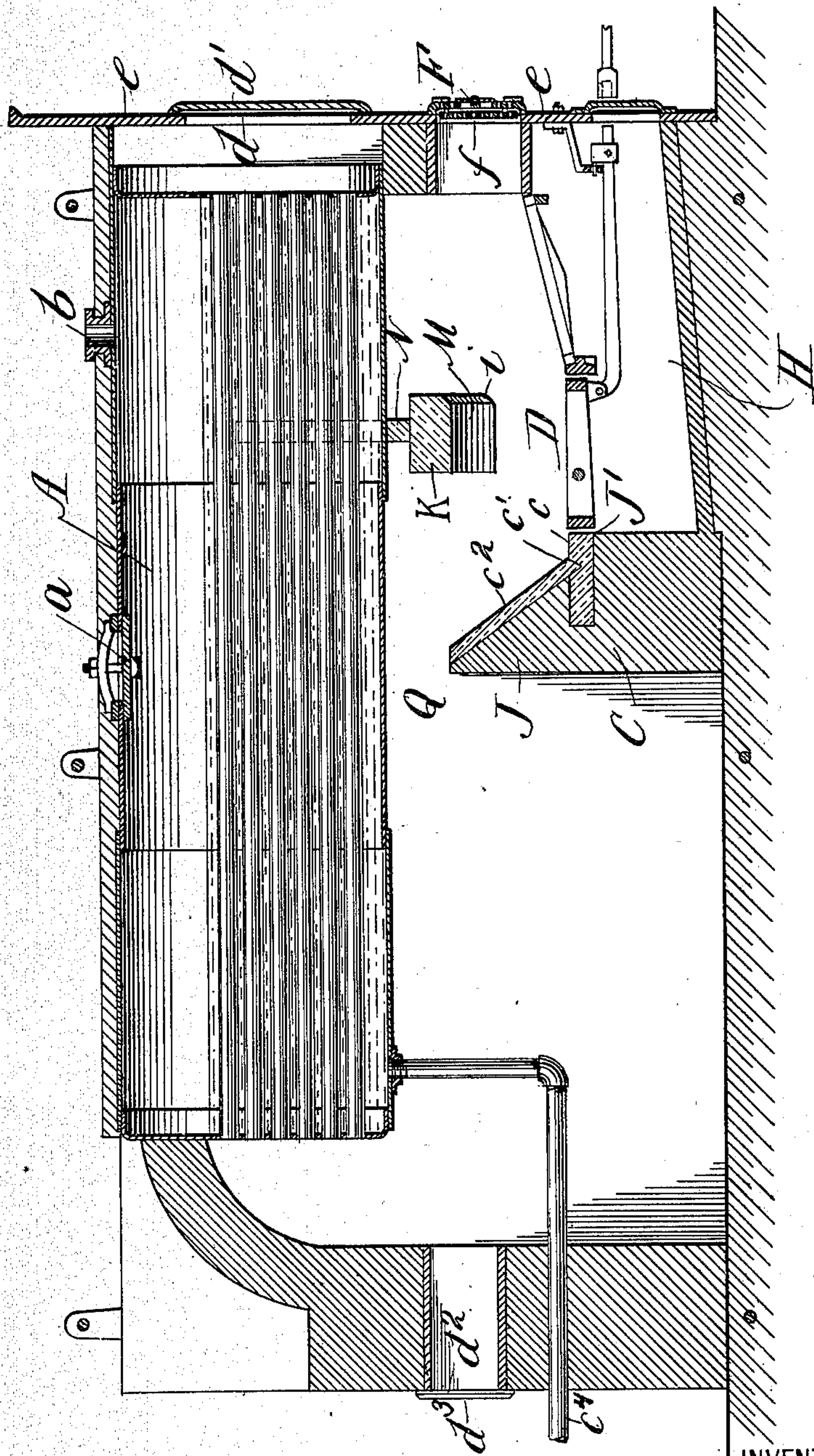
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R. L. WALKER.

SMOKELESS AND COAL SAVING FURNACE.

APPLICATION FILED AUG. 2, 1901. RENEWED NOV. 28, 1902.

NO MODEL.



WITNESSES:

*Harry Goss.*  
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# UNITED STATES PATENT OFFICE.

ROBERT L. WALKER, OF BROOKLYN, NEW YORK.

## SMOKELESS AND COAL-SAVING FURNACE.

SPECIFICATION forming part of Letters Patent No. 732,909, dated July 7, 1903.

Application filed August 2, 1901. Renewed November 28, 1902. Serial No. 133,091. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT L. WALKER, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Smokeless and Coal-Saving Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to furnaces in which various kinds of fuel are employed, particularly hard or soft coal, used for generating steam and for heating purposes.

The principal object of the invention is to economize in the use of coal and secure a greater heating power from a given quantity of the fuel used than has heretofore been possible and also to prevent smoke as much as possible.

The invention consists, essentially, in an improved construction of the bridge-wall and in numerous details and peculiarities of the combination and arrangement, substantially as will be hereinafter more fully explained and then pointed out in the claims.

I attain the objects in view by the mechanism and construction illustrated in the accompanying figure of drawing, which represents a longitudinal section of the furnace and boiler connected therewith and my improved bridge-wall construction.

A represents a return tubular boiler provided with the usual manhole *a*, having a cover and fastening devices for securing the cover to the boiler, *b* the opening for the exit of steam from the boiler, and *c*<sup>4</sup> the blow-off pipe, communicating with the interior of boiler and passing through the setting of the furnace, on the outer surface thereof.

B denotes the setting of the boiler, having an opening *d* in the front of the furnace through the iron facing *e*, which forms a part of the setting B, and the said opening *d* is provided with a cover *d'*.

Q is the draft passage-way, and H indicates the ash-pit.

The setting B is also provided with an opening *d*<sup>2</sup> through it, in the rear wall thereof, which is also provided with a cover or door *d*<sup>3</sup>. These openings *d* and *d*<sup>2</sup> afford ingress and

egress to persons when the boiler and furnace require cleaning and repairing.

The front iron facing *e* of the boiler-setting B is, furthermore, provided with an opening having draft-doors F, provided with a number of perforations *f' f'* therein for the admission of air to the furnace above the surface of the burning fuel upon the grate.

C indicates the entire bridge-wall, which is built up from the foundation of the furnace for about one-half of its height and is rectangular in form, as shown at J', and upon the top front surface of the rectangular portion of the bridge-wall J' and extending rearwardly from its front surface I place the V-shaped sill *c*, having a V-shaped recess *c'*, in which the lower beveled end of the slated tile *c*<sup>2</sup> is inserted and extends obliquely upward and backward, resting upon and forming a front facing for the oblique brick portion of the bridge J of the bridge-wall C.

K represents one of the bricks of which the fire-arch M is composed. The front lower corner of each of the bricks K is rounded or beveled off, and when the entire fire-arch is built up its downward-projecting front surface, extending across the entire width of the furnace, presents a rounded and beveled construction, as illustrated at *i*.

The arch of my improved furnace, made as herein described, extending from side to side of the furnace, subserves a valuable and useful purpose, promotes durability, and assists the fireman in manipulating the stoking-iron, as will readily appear from the description hereinbefore set forth.

The fire-arch M, composed of its lower surface of rounded beveled bricks, as hereinbefore described, aids in performing the additional function in connection with the fire-arch extension N, which transversely encircles the lower longitudinal half of the boiler A, in that they retard for a time the hydrocarbon gases evolved from the green fire upon the grate. The arch M and its extension N prevent too rapid passage of the air containing the vivifying constituent oxygen with the unconsumed gases from the fuel through the furnace.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a furnace having a suitable combus-



tion-chamber, grate and ash-pit, a bridge-wall having a rectangular lower portion, and an inclined or sloping upper part, a horizontal sill supported upon the top of the said rectangular portion, and having a V-shaped recess therein, and tiles whose lower ends engage the said recess, said tiles extending obliquely upward and backward and resting upon and forming a front facing for the inclined upper portion of the bridge-wall, substantially as described.

2. In a furnace having therewith a boiler, combustion-chamber, ash-pit and grate, a fire-arch arranged in contact with the boiler and having the edge of its lower front face rounded, a bridge-wall having a rectangular

lower portion and an inclined or sloping upper part, a horizontal sill supported upon the top of the said rectangular portion and having a V-shaped recess therein, and tiles whose lower ends engage the said recess, said tiles extending obliquely upward and backward, and resting upon and forming a front facing for the inclined upper portion of the bridge-wall, substantially as described.

In testimony whereof I have hereunto affixed my signature in presence of two witnesses.

ROBERT L. WALKER.

Witnesses:

JAMES R. ROGERS,  
M. L. SHAY.