

(No Model.)

D. C. ADAMS.
SMOKE CONSUMER.

No. 467,745.

Patented Jan. 26, 1892.

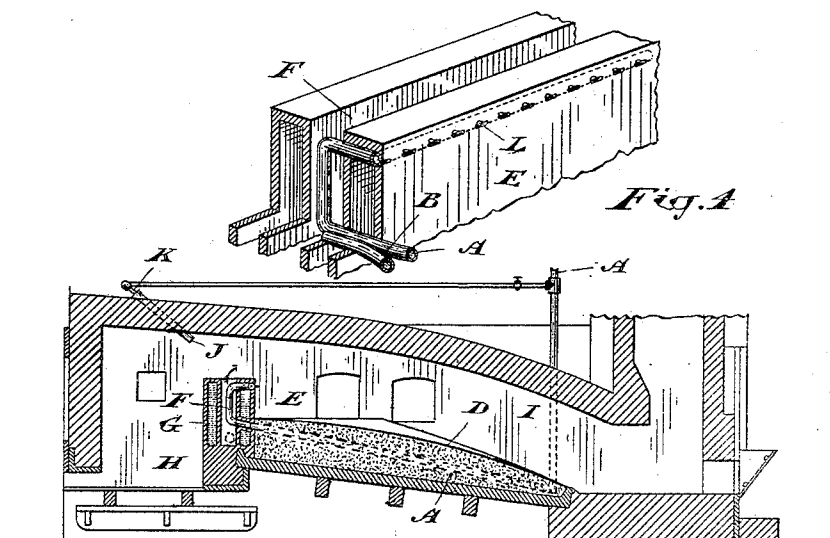


Fig. 1

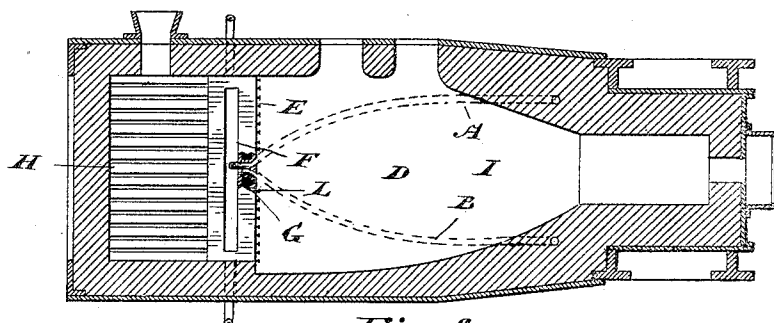


Fig. 2

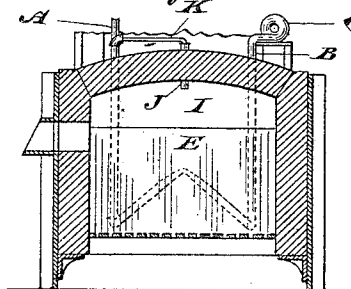


Fig. 3

Witnesses

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UNITED STATES PATENT OFFICE.

DAVID C. ADAMS, OF TORONTO, CANADA.

SMOKE-CONSUMER.

SPECIFICATION forming part of Letters Patent No. 467,745, dated January 26, 1892.

Application filed March 5, 1891. Serial No. 383,818. (No model.)

To all whom it may concern:

Be it known that I, DAVID CHARLES ADAMS, iron-worker, of the city of Toronto, in the county of York, in the Province of Ontario, have invented certain new and useful Improvements in Smoke-Consumers, of which the following is a specification.

The object of the invention is to design a smoke-consumer applicable to furnaces for manufacturing iron, and to locomotive, stationary, steamboat, smelting, and all other classes of furnaces; and it consists in the peculiar construction, arrangement, and combinations of parts hereinafter more particularly described and then definitely claimed.

Figure 1 is a sectional side view of any ordinary balling-furnace provided with my improved smoke-consumer. Fig. 2 is a plan of the same. Fig. 3 is a cross-sectional elevation. Fig. 4 is an enlarged detail of the bridge, showing the manner of introducing blasts of superheated air and superheated steam.

As before stated, my improved smoke-consumer is applicable to all kinds of furnaces; but for the purpose of this specification I show it applied to a balling-furnace. The arrangement of the parts will of course differ according to the size and style of the furnace; but an explanation of its application to a balling-furnace will be sufficient to enable any one to understand the construction and operation of my improved smoke-consumer.

In the drawings, A represents a steam-pipe, which is supplied with steam from any suitable source. B is an air-pipe, which is preferably supplied with air under pressure from the pump or fan C. These pipes A and B extend down into the sand D, forming the bottom of the furnace. Both of these pipes are carried below this bed to the bridge E, as indicated in the drawings. A chamber F is formed in the bridge E, and is preferably surrounded by a water-space G, which is supplied with flowing water in such a manner as to protect the said bridge. The chamber F may be open at its top, as indicated in the drawings, or a perforated top may be provided. The steam-pipe A extends into the chamber F, and is extended up to a point near the top of the said bridge, where it is carried back through the inner wall of the

bridge E, where it connects with a branch pipe with fan-shaped openings L. (See Fig. 4.)

The superheated air which enters the chamber F escapes into the furnace immediately above the bridge E, where it mixes with the smoke passing over the said bridge. It will be seen that as the incoming air rises vertically through the chamber F it will slightly raise the heated products of combustion and keep them from close contact with the top of the bridge, and thus save the same from being burned. The steam, being highly heated by the intense heat of the sand through which the pipe A passes, becomes decomposed, thus forming a mixture of oxygen and hydrogen gas, which is discharged through the fan-shaped openings L and forms a flame, which immediately ignites the smoke charged with the heated air from the chamber F, producing perfect combustion, and as a consequence the intense heat is secured with a minimum consumption of fuel. By arranging the discharge of the air and decomposed steam in this relative position I produce the best effect, as the air keeps the products of combustion from the top of the bridge, and the decomposed steam mingles with said products of combustion after they have crossed the bridge, and thus the most intense heat is generated just where it is wanted. With the view of protecting the top of the furnace I introduce an air-pipe J through it at an angle pointing toward the inner corner of the bridge E, and into this pipe I insert a small steam-jet K, supplied with steam from the pipe. This steam-jet K forms, with the air-pipe J, an injector to force into the point desired a mixture of steam and air, which acts as a blast to force the flame down toward the bed D, at which point the most intense heat is required, and thereby carrying the flame from the top of the furnace.

I do not wish to confine myself to the exact arrangement of the detail illustrated in the drawings, for, as I before stated, the details of the arrangement will be altered to suit the class of furnace to which my smoke-consumer is applied.

What I claim as my invention is—

1. A furnace having a bridge provided with a longitudinal chamber open at the top, in

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combination with a hot-air pipe leading into said chamber, and steam-pipes having openings from the side of the bridge into the heating-chamber, substantially as described.

- 5 2. A furnace provided with a bridge divided longitudinally by a chamber open at the top, an air-pipe leading into said cham-

ber, and a water-passage around said chamber, substantially as described.

Toronto, February 16, 1891.

DAVID C. ADAMS.

In presence of—

CHARLES C. BALDWIN,

JOHN E. CAMERON.