(No Model.)

A. C. BADAN.

SMOKE CONSUMER.

No. 399,817. Patented Mar. 19, 1889.

Fig. 1.

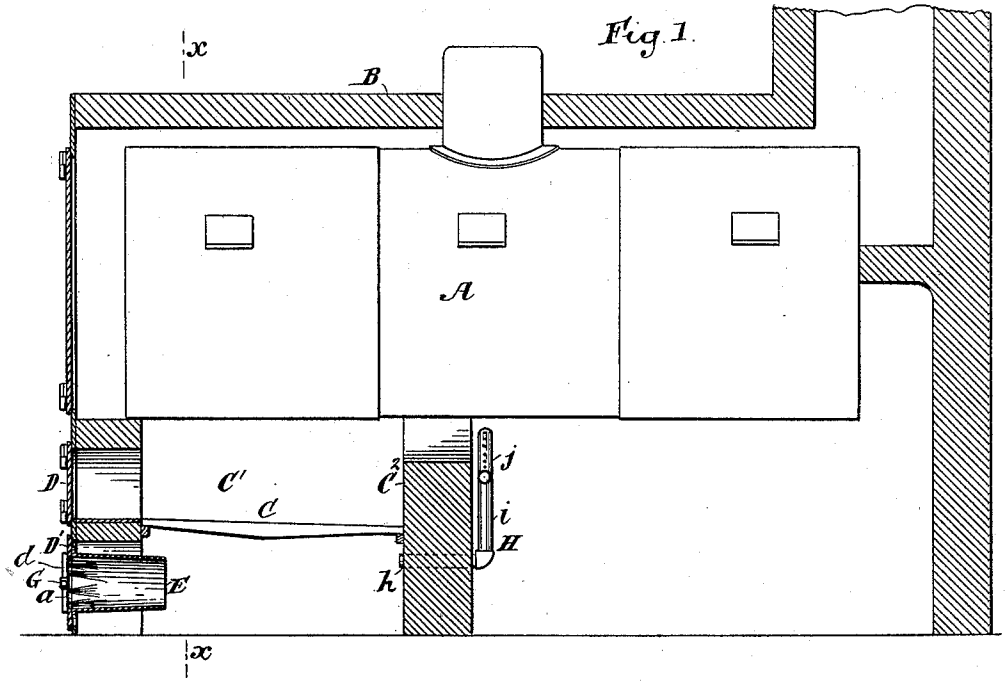


Fig. 3.

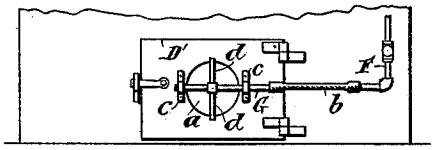
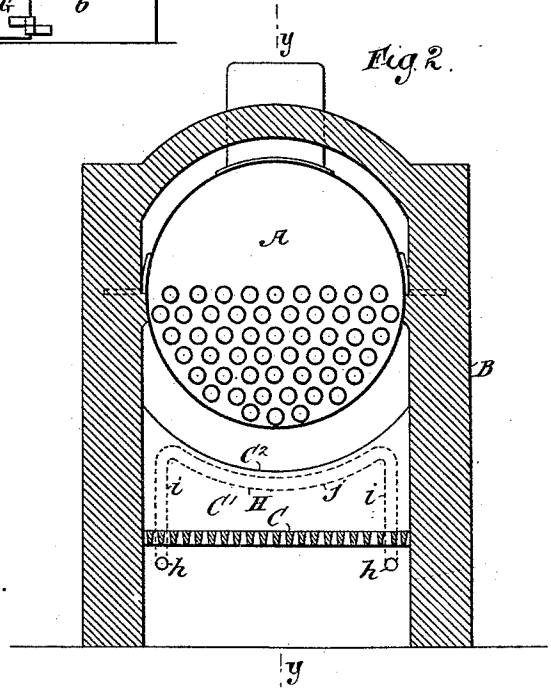


Fig. 2.



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UNITED STATES PATENT OFFICE.

ALCIDE C. BADAN, OF NEW YORK, N. Y.

SMOKE-CONSUMER.

SPECIFICATION forming part of Letters Patent No. 399,817, dated March 19, 1889.

Application filed March 23, 1888. Serial No. 268,245. (No model.)

To all whom it may concern:

Be it known that I, ALCIDE C. BADAN, of New York, in the county and State of New York, have Invented a certain new and useful Improvement in Smoke-Consumers for Furnaces, of which the following is a specification.

I will describe a smoke-consumer embodying my improvement, and then point out the novel features in claims.

In the accompanying drawing, Figure 1 is a vertical longitudinal section of a smoke-consumer embodying my improvement, the same being shown as arranged to operate in conjunction with a furnace and boiler, and the section being taken on the plane of the dotted line *y y*, Fig. 2. Fig. 2 is a transverse vertical section of the same, taken on the plane of the dotted line *x x*, Fig. 1. Fig. 3 is a front elevation showing part of my improvement and of the front of the furnace, other parts being broken away to save space.

Similar letters of reference designate corresponding parts in all the figures.

A designates a boiler, here shown as a tubular boiler. It is arranged in brick-work, B, which may be of the usual or any ordinary construction.

C designates a grate arranged in a fire-box, C′. To the rear of the fire-box is a bridge-wall, C^2, shown as having a curved upper surface. Products of combustion pass from the grate over the bridge-wall.

D designates the door of the furnace, and D′ the door of the ash-pit. In the door of the ash-pit is formed an opening, *a*. This opening I prefer to form about centrally in said door. Firmly secured at one end in said opening is a tube, E. The tube E is open at both ends. It extends inwardly, and in this example of my improvement terminates at a point just beneath the forward end of the grate. I prefer that this tube shall taper somewhat inwardly, as shown; but this I do not consider wholly essential.

F designates a steam-pipe. This pipe is coupled at its lower extremity to a section of flexible pipe or hose, *b*, preferably made of india-rubber. The other end of the pipe or hose, *b*, is connected to a pipe, G. The pipe G is secured upon the ash-pit door D′ by straps *c*. Extending from the pipe G are branch pipes *d*. The pipe G and the branch pipes *d* constitute an injector, and are in effect a single pipe. They form, in the example of my improvement shown, an approximate cross, which extends over the outer open mouth of the tube E. The sides of the pipe G and branch pipes *d* nearer the tube E are perforated. Steam injected through the pipe F is delivered through the perforations in the pipe G and branch pipes *d* into the tube E, and causes a suction of atmospheric air through the pipe E. Air is therefore forced into the ash-pit and beneath the grate under pressure. By making the pipe or hose *b* flexible it permits the ready opening of the ash-pit door D′.

H designates a pipe comprising two arms, *h*, which latter extend through the bridge-wall and open into the ash-pit. This pipe also comprises upright portions *i* and a horizontally curved portion, *j*. The curved portion *j* is arranged near the top of the bridge-wall and behind the same. The curve therein conforms substantially to the curve of the bridge-wall. The upper side of the curved portion *j* is perforated. Air forced into the ash-pit through the tube E passes into the arms *h* of the pipe H under pressure, and is delivered through the perforations in the portion *j* of the pipe H against the products of combustion passing over the bridge-wall. The pipe H therefore constitutes a distributer for the air. The oxygen of the air combines with the carbon of the smoke, causing combustion, whereby the carbon is consumed. The jets of air, striking the products of combustion, also cause the latter to be forced into intimate contact with the boiler. The injector, acting through the tube E, also operates as a blower to accelerate the draft of the furnace.

I wish it to be understood that I do not limit myself to the peculiar arrangement of pipes for injecting steam into the tube E.

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

1. The combination, with the furnace, of an injector comprising a perforated pipe, an open-ended tube beneath the furnace, through which air is forced by the injector, a bridge-wall, and an air-distributer consisting of a pipe having a perforated portion arranged at the rear of the bridge-wall, a vertically-ex-

tending portion, also at the rear of the bridge-wall, and a horizontally-extending portion extending through the bridge-wall and opening into the ash-pit, said pipe being otherwise independent of the bridge-wall, substantially as specified.

2. The combination, with a furnace, of an injector comprising a perforated pipe, an open-ended tube beneath the furnace, through which air is forced by the injector, a bridge-wall, and an air-distributer consisting of a pipe having a curved perforated portion arranged at the rear of the bridge-wall, vertically-extending portions, also at the rear of the bridge-wall, and horizontally-extending portions extending through the bridge-wall and opening into the ash-pit, said pipe being otherwise independent of the bridge-wall, substantially as specified.

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