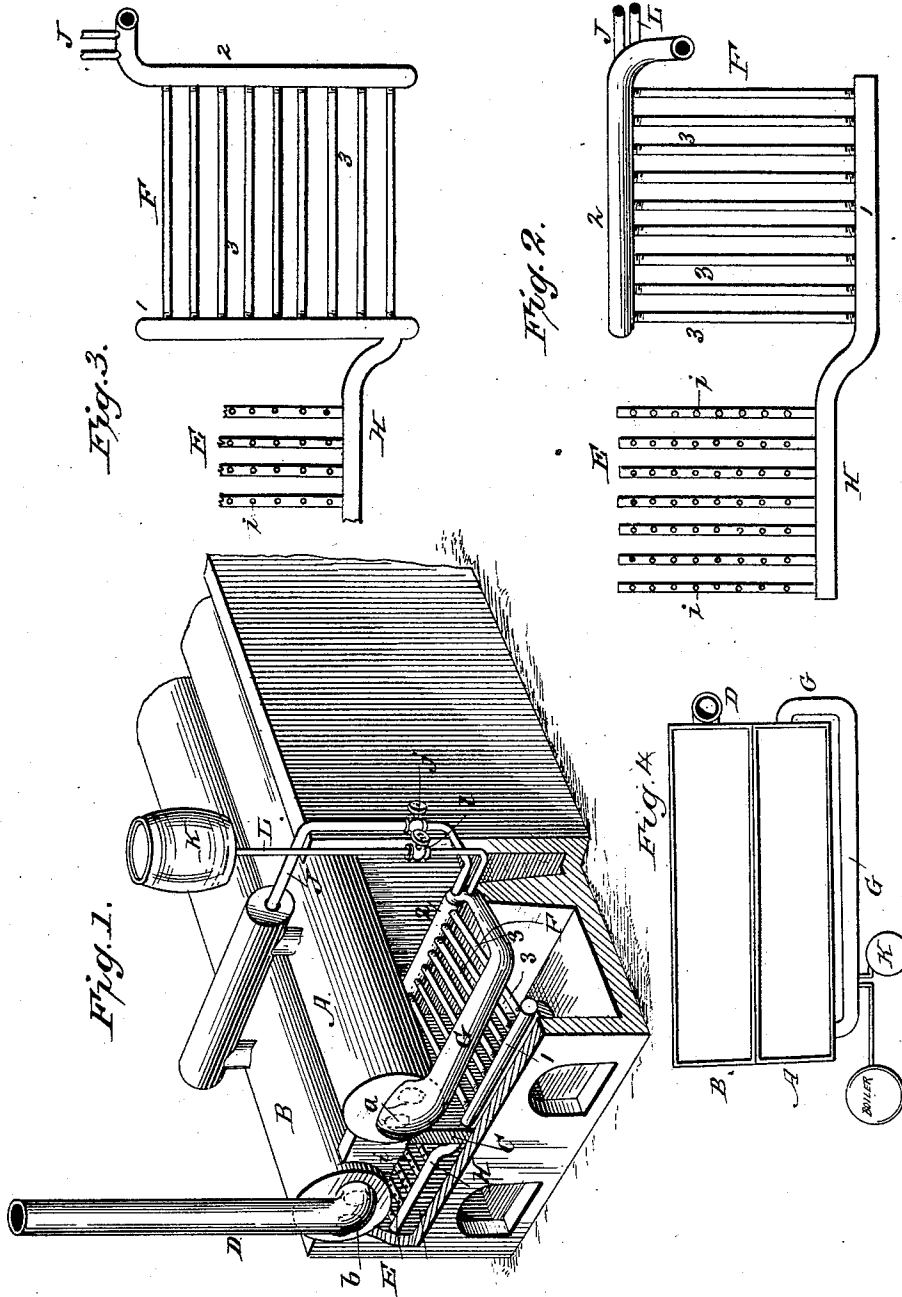


(No Model.)

R. H. F. SEWALL.
SMOKE CONSUMER.

No. 387,661.

Patented Aug. 14, 1888.



WITNESSES:
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ROBERT H. F. SEWALL, OF BIRMINGHAM, ALABAMA.

SMOKE-CONSUMER.

SPECIFICATION forming part of Letters Patent No. 387,661, dated August 14, 1888.

Application filed June 28, 1887. Serial No. 242,804. (No model.)

To all whom it may concern:

Be it known that I, ROBERT H. F. SEWALL, of Birmingham, in the county of Jefferson and State of Alabama, have invented a new and useful Improvement in Smoke-Consumers, of which the following is a specification.

My invention is an improved smoke-consumer; and it consists in certain features of construction and novel combinations of parts, as will be hereinafter described and claimed.

In the drawings, Figure 1 is a perspective sectional view of my invention as applied to a battery of two two-flue boilers. Fig. 2 is a detail view of the invention. Fig. 3 is a detail view showing a somewhat different arrangement of some of the parts, and Fig. 4 is a plan view showing a somewhat different construction and arrangement of some of the parts.

While the invention is shown as applied to two two-flue boilers, and will be so described hereinafter, it is manifest it may be used in other arrangements and connections; and it is also manifest that when the invention is employed with furnaces not primarily used in connection with boilers a small boiler can be provided to furnish steam or vapor for the superheater, as will be understood from Fig. 4, in which a boiler is located alongside of the furnaces and has a steam-pipe leading into the flue G near the superheater. Such boiler may be heated in any suitable manner and the furnaces may be utilized for boiling sugar, or for other desired purposes.

The boilers A B (shown) may be of ordinary construction and be supported in suitable manner, a separating-wall, C, being usually provided between them. The chimney D draws through the return-flues *b* of the boiler B, and through the burner-tubes E, superheating-chamber F, and thence through the flues *a* from the furnace of the boiler A, through the medium of the smoke-flue G, as will be more fully described hereinafter.

The superheater is by preference arranged to serve as the grate for the furnace of boiler A, and is formed with the hollow front and rear or end portions, 1 and 2, and the tubular grate-bars 3, extended between and opening into said portions. These grate-bar tubes may be circular, oval, or of other desired cross-sectional shape, and may be connected in any

suitable manner with the portions 1 and 2. That shown, and consisting in forming the opposite ends of the tubes with right and left hand threads and screwing them into the front and rear portions, 1 and 2, will be found a convenient construction in small and medium-sized superheaters.

The smoke from the fire built on the superheater-grate comes back through the return-flues *a* of said boiler, and it is received by the smoke-flue G, which is connected at one end with said flues *a*, and communicates at its other end with the superheater, and preferably with the rear portion, 2, thereof.

A tube or main, H, leads from the superheater, and preferably from the front portion, 1, thereof, and extends under the boiler B, passing usually through the separating-wall C, as shown. To this pipe or main H is connected one end of the burner tube or tubes E, of which I preferably employ a number, as shown, and which may be connected to main H in similar manner to the connection of the grate-bar tubes with the portion 1 of the grate. These burner-tubes are perforated at *i* for the exit of the combustible material therefrom.

A steam-pipe, J, leads into the superheater and serves to increase the draft, as will be readily understood.

A valve, *j*, is provided for regulating the supply of steam, which may, in the construction shown, be obtained from one or the other of the boilers A B.

An oil tank or reservoir, K, is connected by pipe L with the superheater, a valve, *l*, being provided by which to regulate the supply of oil to the superheater.

Any suitable oil may be used, and in practice it serves to increase the combustible character of the products contained in the smoke, and insures a more perfect consumption thereof as they pass out of the burner-tubes.

The operation will be readily understood. The smoke, &c., from the wood, coal, or other fire pass through smoke-flue G into the superheater, where they mix with the oil and are heated and given additional impetus by the steam. The smoke, oil, &c., are heated to a high degree in their passage through the superheater, and issue from the burner tube or

tubes in a hot flame, furnishing the heat necessary for the second boiler, and losing nothing in smoke, as no smoke passes up the chimney.

5 It will be understood that in some cases it may be preferred to arrange the end portions, 1 and 2, at the right and left hand ends of the fire-box, as shown in Fig. 3, instead of at the front and rear ends thereof, as thereby shorter
10 connecting-tubes may be used in some cases.

Having thus described my invention, what I claim as new is—

1. In a smoke-consumer, the combination of a furnace, a burner or burners separated
15 from said furnace, and a superheater, a smoke-passage being provided leading from said furnace to said burner or burners through the superheater, substantially as set forth.

2. A smoke-consumer, substantially as here-
20 in described, comprising the superheating-chamber, the smoke-passage communicating therewith, the oil-supply pipe leading into such chamber, and the perforated burner pipe or pipes, substantially as set forth.

25 3. In a smoke-consumer, a superheating-chamber, a smoke-flue leading thereinto, and a perforated burner pipe or pipes combined with an oil-supply pipe and a steam-pipe leading into the superheating-chamber, substan-
30 tially as set forth.

4. A grate having hollow end portions and hollow tubes extended therebetween and forming a superheating-chamber, combined with a burner pipe or pipes, and a smoke-flue com-
35 municating with such superheating-chamber, substantially as set forth.

5. In a smoke-consumer, the combination,

with a boiler and an oil tank or reservoir, of a superheating-chamber, a burner tube or tubes, the smoke-flue, the steam and oil pipes lead-
40 ing, respectively, from the boiler and the oil-tank to said superheating-chamber, and valves in said pipes for controlling the supply of steam and oil, substantially as set forth.

6. In a smoke-consumer, a hollow grate form-
45 ing a superheating-chamber, in combination with a tube or main leading from said chamber, and a plurality of perforated burner-tubes connected with said tube or main, and a smoke flue or passage communicating with said hol-
50 low grate, substantially as set forth.

7. In a smoke-consumer, the combination of the grate forming a superheating-chamber and having the end portions, 1 2, and hollow tubular connections between said portions 1
55 and 2, the smoke-flue connected with portion 2, and the main or tube connected with portion 1 and provided with a burner or burners, substantially as and for the purposes specified.

8. The combination, with two boilers, of a
60 furnace under one of said boilers, a burner or burners under the other boiler, a superheater, a pipe connecting such superheater with the burner or burners, and a pipe or flue for conducting the products of combustion into the
65 superheater, all being substantially as described, whereby the products of combustion from the furnace are conducted through the superheater to the burner or burners, as and for the purposes specified.

ROBERT H. F. SEWALL.

Witnesses:

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