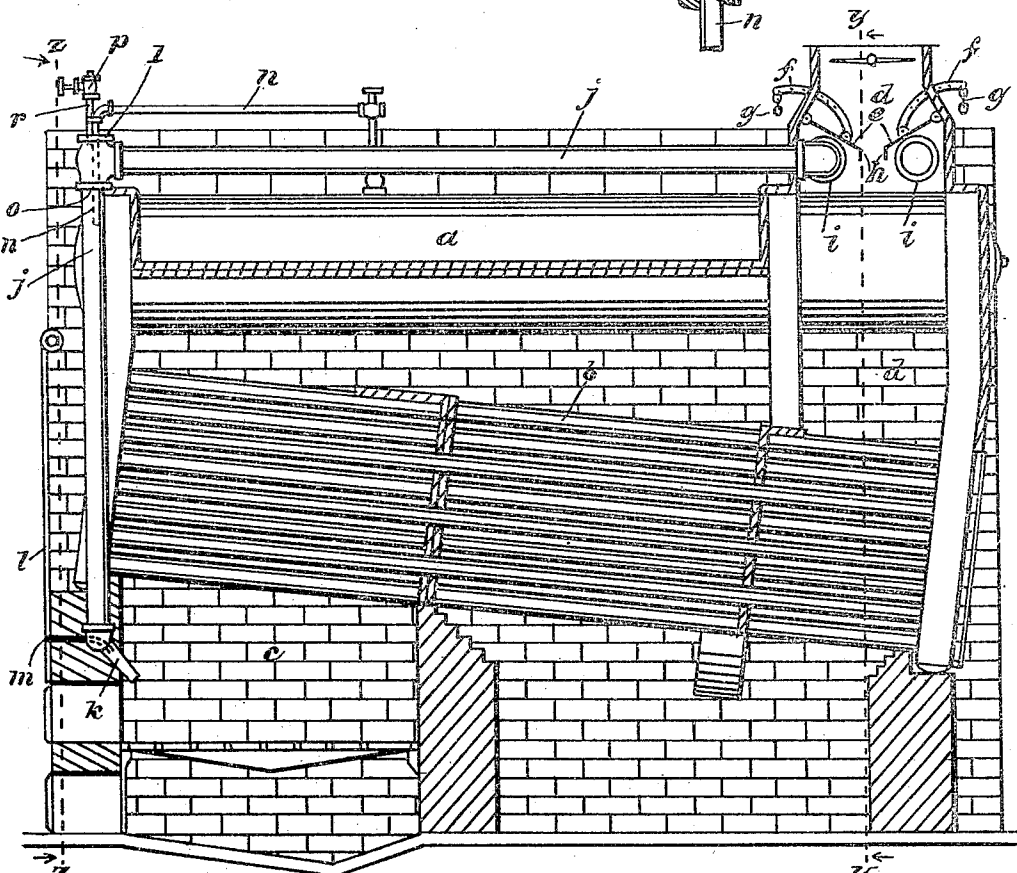
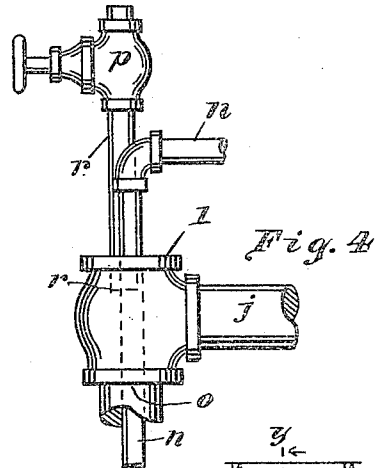
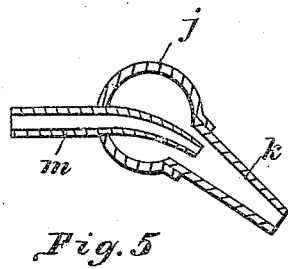


T. REES.
SMOKE CONSUMER.
APPLICATION FILED JUNE 5, 1909.

957,377.

Patented May 10, 1910.

2 SHEETS—SHEET 1.



Witnesses,
C. C. Clark
Alice Mara

Fig. 1

Inventor

Thomas Rees
J. D. Clark

per

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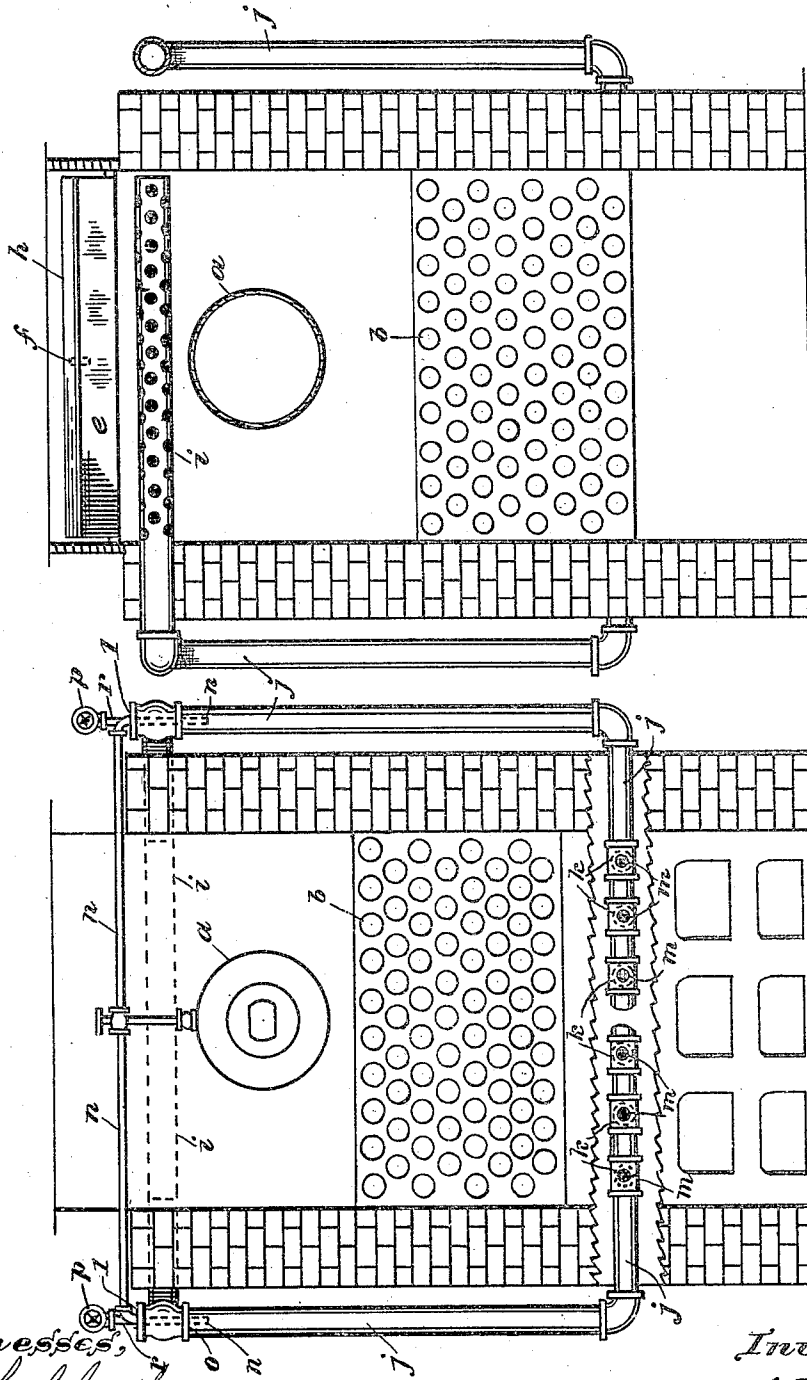


Fig. 1

Fig. 2

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UNITED STATES PATENT OFFICE.

THOMAS REES, OF CHICAGO, ILLINOIS.

SMOKE-CONSUMER.

957,377.

Specification of Letters Patent.

Patented May 10, 1910.

Application filed June 5, 1909. Serial No. 500,438.

To all whom it may concern:

Be it known that I, THOMAS REES, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Smoke-Consumers, of which the following is a specification.

This invention relates to new and useful improvements in smoke consumers and relates more particularly to that class of smoke-consumers wherein the products of combustion are caused to return to the fire-box, and wherein steam and air are combined to create a suction, and pressure for the travel of the gases.

It is an object of this invention to provide in a device of this character, novel means whereby the products of combustion are caused to travel, and return to the fire box, and it consists of baffle deflector dampers, adapted to deflect the products of combustion to perforated draft pipes, and pipes which lead to the fire-box of the furnace.

It is also an object of this invention to provide novel means in a device of this character wherein the products of combustion are forced in front of the fire in the fire-box.

Furthermore, an object of this invention is to provide a novel furnace wherein means are employed to cause atmospheric air to enter and mingle with the gases in the pipes on their passage to the fire-box.

It is a further object of this invention to provide novel means of introducing air into the nozzles to aid in a more perfect combustion, and assist in reburning the chimney gases.

In describing the details of the invention, reference will be had to the accompanying drawings wherein like characters denote corresponding parts in the several views, in which—

Figure 1 is a view in side elevation, partly in section, illustrating the device. Fig. 2, is a front elevation, and cross section on the lines Z, Z of Fig. 1. Fig. 3 is a vertical section on the line Y—Y of Fig. 1 looking toward the front of the furnace. Fig. 4 is a view in detail of a pipe with valve attachment. Fig. 5, is a detail view of nozzles, with air inlet pipe attachment.

In the drawings *a*, indicates the drum of a water tube boiler, *b*, the water tubes, *c*, the fire-box arranged beneath the water tubes, *d*, is the smoke box, or opening to the stack

end of the furnace. Arranged within the smoke box are two baffle dampers *e*, which are provided with a lifting arm *f*, and chain *g*. The baffle dampers *e*, are equal in width to the smoke box, and extend downwardly about midway of the smoke box, they can be operated independently of each other, the mode of operation is as follows. Attached to the upper surface of said dampers, is a curved arm *f*, to which a chain *g*, is secured, the pulling downwardly of this chain lifts the damper. It may be stated that the dampers are held as illustrated, normally open by their own weight. If in the operation it is found necessary to elevate both baffle dampers, then almost the entire draft from the fire would be closed off; so also if the two dampers were operated independently of each other, the one raised, the other lowered, a partial draft is obtained. The lowering of both dampers as shown in the present illustration, causes a deflection downward of all gases that reach the stack, said gases are assisted downward by lips (*h*), at the lower point of said dampers. The purpose of the operation will be understood by those familiar with the class of invention.

Situated centrally below the baffle dampers, on either side of the smoke box, are two perforated suction pipes (*i*), which extend to either side of said box, and passing through the side walls have communicating therewith pipes (*j*), which pass forwardly parallel with said wall to approximately even with the head of the drum, thence downwardly still parallel with the side walls. The pipes then extend inwardly at right angles through the side walls, and approaching each other terminate approximately centrally of the front wall. Extending inwardly, and downwardly into the fire-box (*c*), from the pipes are a series of nozzles (*k*); extending through the face plate (*l*), into each nozzle is a series of small pipes (*m*), through which external atmospheric air is injected into the gases in their passage into the fire-box, through said nozzles. Referring to my Patent of Aug. 28, 1906, No. 829,543, the drawings show these nozzles as pointing over the fire in the direction of the bridge wall. It was the intention at that time to show in the discharge of the fume and gases that by directing the products of combustion over the fire, the draft thus created would cause a better reburning of

the gases. In practice it has been found that by turning the points of the nozzles to the front of the fire better results are obtained.

5 Communicating with the drum (*a*), is a steam pipe (*n*), which extends forwardly to a point approximately central of and above the front wall of the furnace where it branches out in opposite directions. Each
10 of these branches is provided with a depending portion (*o*), that extends within the downwardly extending portions at (*l*) of the pipes. The end of the steam pipe (*n*), extends beyond the point of junction of the
15 horizontal part, and the vertical part of the pipes. This connection creates a vacuum within the horizontal part of said pipes backward to the suction pipes (*i*), as well as causes a draft within the vertical part of the
20 pipes.

Referring again to my Patent of Aug. 28, 1906, it will be seen that the steam jets, or pipes, from the boiler were placed in close proximity to the entrance of the pipes into
25 the hood; my present invention demonstrates that the jets may be placed at any elbow of the pipes, and the operation will cause the same result, a vacuum is created between that entrance of steam and air, and
30 the receiving point of the gases of the hood, or baffle dampers.

It has been found that some classes of coal discharge a character of gas that will not re-burn without a mixture of atmospheric air
35 when returned to the fire-box, and to assist in reburning these gases, I introduce a valve (*p*), which connecting with an inlet pipe (*r*), is carried just within the vertical end of the pipes, along side of the steam pipe (*o*).

40 I am aware that in the construction of some water-tube boilers, the draft or stack end is in front, and some in back, and some near the floor in rear, and while I have confined my illustrations in placing the baffle
45 dampers on the top and in the back of the furnace, it will be understood that these dampers, and pipes can be placed at any convenient point that would catch the smoke and fume between the fire box and the stack,

without departing from the spirit of the invention. 50

In the drawings, in Fig. 3, the baffle damper is drawn upward against the stack pipe, to better illustrate the position of the suction pipe. 55

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is.—

1. Smoke consuming apparatus comprising a furnace having a chamber in the draft end thereof, a fire box, a perforated suction
60 pipe upon each side of said chamber, dampers adapted to close said chamber, hinged above said suction pipes, lips on said dampers extending downwardly therefrom, said
65 dampers and said lips acting as baffle plates, pipes extending from one end of each of said suction pipes and forming continuations thereof, and having extensions, other pipes
70 extending inwardly from said extensions, and nozzles on said last mentioned pipes extending downwardly into the fire box of said furnace.

2. Smoke consuming apparatus comprising a furnace having a chamber in the draft
75 end thereof, a fire box, a perforated pipe upon each side of said chamber, pipes extending laterally from one end of each of said perforated pipes, other pipes forming
80 continuations of said lateral pipes, and extending at an angle thereto, steam and air inlet pipes entering the latter pipes at their junctions with said lateral pipes, the nozzles of one set of said inlet pipes being above the
85 nozzles of the other set, pipes connected to the lower ends of said last mentioned pipes and extending inwardly therefrom, nozzles on said last mentioned pipes projecting into said fire box, and pipes extending through
90 the wall of the furnace and terminating within said nozzles.

In testimony whereof I affix my signature in presence of two witnesses.

THOMAS REES.

Witnesses:

C. C. CLARK,
A. MARA.