

No. 829,543.

PATENTED AUG. 28, 1906.

T. REES.

SMOKE CONSUMER.

APPLICATION FILED NOV. 15, 1905.

2 SHEETS—SHEET 1.

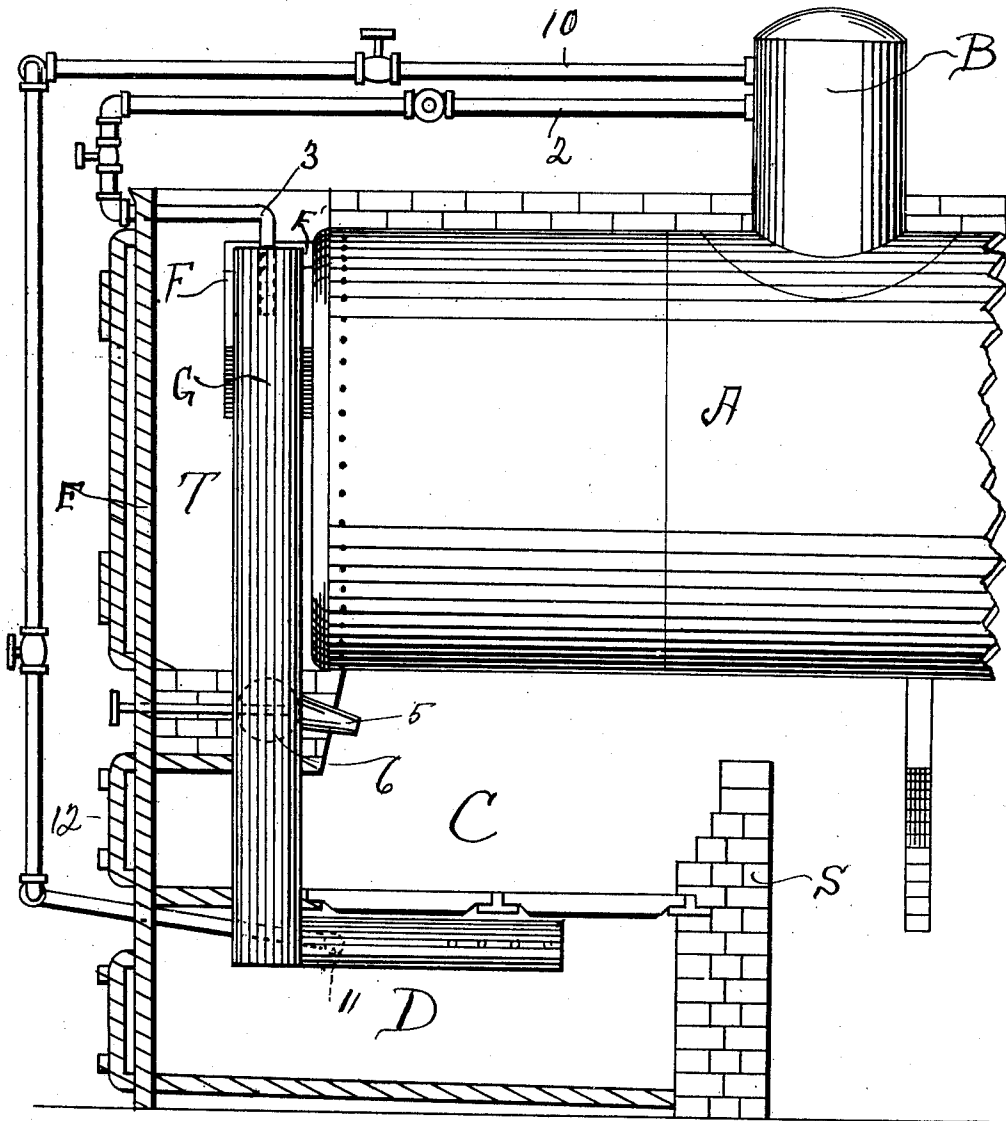


Fig. 1

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M. Hansen.
D. S. Conger.

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per F. D. Clark
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2 SHEETS—SHEET 2

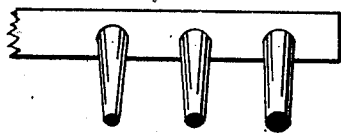


Fig. 3

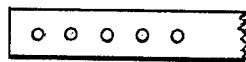


Fig. 4

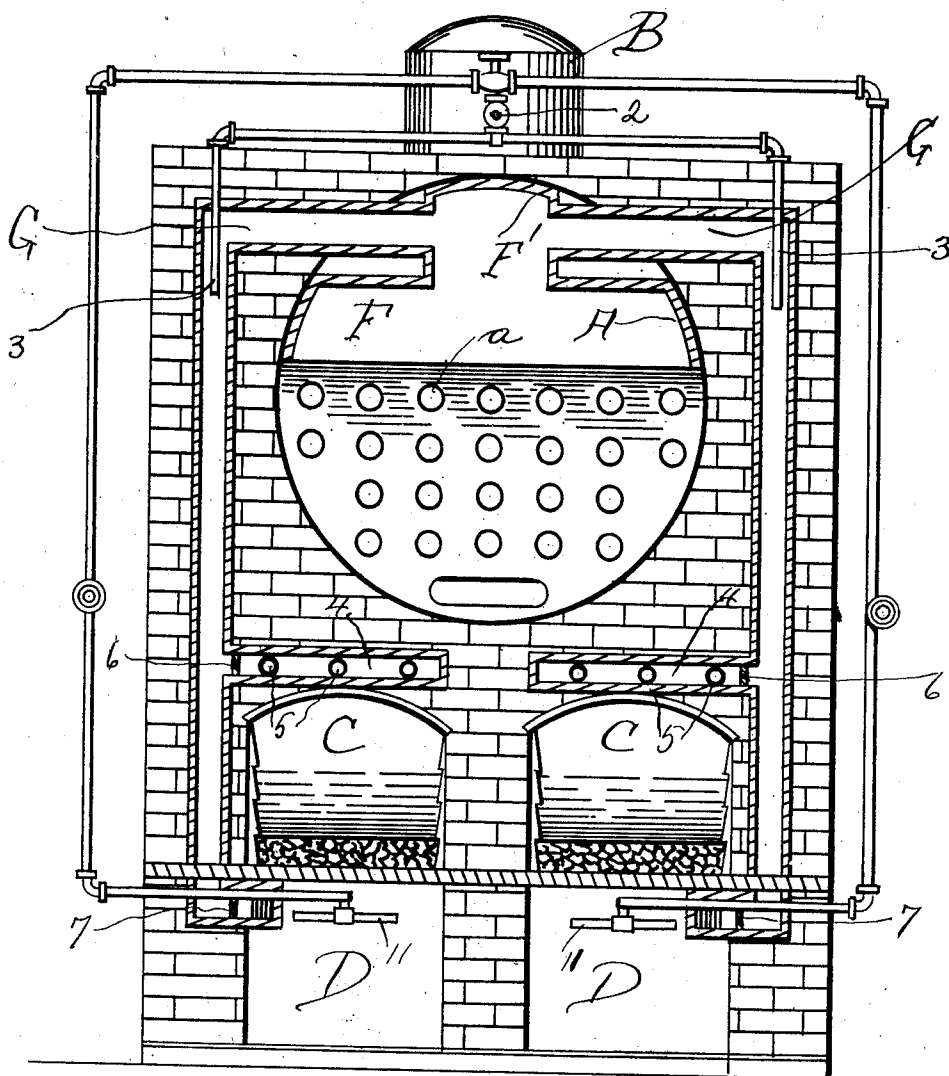


Fig. 2

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UNITED STATES PATENT OFFICE.

THOMAS REES, OF CHICAGO, ILLINOIS.

SMOKE-CONSUMER.

No. 829,543.

Specification of Letters Patent.

Patented Aug. 28, 1906.

Application filed November 15, 1905. Serial No. 287,474.

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 pass and repass the fire-bed and wherein steam is employed to create sufficient pressure for the travel of the products.

It is also an object of the 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 a hood adapted to receive the products, said hood communicating with the conduit-pipes which lead to the ash-pit of the furnace.

Furthermore, an object of this invention is to provide a novel furnace wherein means are employed for controlling the products of combustion in their travel, which is done by placing dampers within the conduit-pipes.

It is a further object of this invention to provide novel means in a device of this character wherein the products of combustion are forced against the bridge-wall of the fire-box.

Finally, an object of this invention is to produce a device of the character noted which will possess advantages in points of simplicity, efficiency, and durability, proving at the same time comparatively inexpensive to produce and maintain.

With the foregoing and other objects in view the invention consists in the details of construction and in the arrangement and combination of parts to be hereinafter more fully set forth and claimed.

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

Figure 1 is a view partly in elevation and partly in section, illustrating the device. Fig. 2 is a cross-section of a boiler-furnace with the invention applied, the section being taken on such lines as to illustrate certain details of the invention. Figs. 3 and 4 are views of details of the invention.

In the drawings, A indicates a tubular boiler provided with a dome B, C the fire-box arranged beneath the boiler, D the ash-pit, S the bridge-wall of the fire-box, E the face-plate of the furnace, and T is the smoke-box of the furnace, all of which are of any ordinary or preferred construction.

Arranged within the smoke-box above the tubes *a* of the boiler is an approximately rectangular hood F, having its lower face open. This hood is equal in width to the boiler and extends downwardly about mid-way of the smoke-box T.

Approximately centrally of the top of the hood F is a chamber or dome F', which has communicating therewith at opposite sides draft-pipes G, which extend to the side walls of the furnace and pass downwardly parallel with the walls and terminate within the ash-pit D. The pipes then extend rearwardly parallel with the walls of the furnace to a point near the bridge-wall, preferably eighteen (18) inches therefrom. The free ends of the pipe are open. On the inner sides of the pipe are arranged series of perforations which are intended to facilitate the discharge of the smoke into the pit. Communicating with the dome B is a steam-pipe 2, which extends to a point approximately above the face-plate of the furnace, where it branches out in opposite directions. Each of the branches is provided with a depending portion 3, which extends within the downwardly-extending portions of the conduit-pipes. This connection is intended to create and force draft in order that the smoke or products of combustion may be carried through the conduit-pipes. Communicating with the downwardly-extending portions of the conduit-pipes and extending at right angles thereto and within the fire-box C are branch conduits 4.

Extending inwardly from each of the branches is a series of nozzles 5. It is the intention of the invention to have nozzles of each series of different sizes—that is to say, the first nozzle of each series to be smaller than the next succeeding nozzle, and so on. It has been found in practice that if all of the nozzles are of the same size it would be the tendency of the smoke to pass through the first nozzle, and thereby distribute the smoke unevenly over the fire-bed; but by having the nozzles of different sizes (and by "sizes" it is meant different-sized discharge-openings) an even distribution is obtained.

Arranged within the conduits are suitable dampers 6 and 7, located at the junction of the conduit-pipes and their branches and the downwardly-extending portions of the conduit-pipes and those portions within the ash-pit, respectively. Also communicating with the dome B of the boiler A is a pipe 10, which radiates and extends downwardly to both sides of the furnace, and the branches terminate within the ash-pit near the forward end of the furnace. The ends of the branches are provided with perforated cross tubes or pipes 11. The perforations are so located that the discharge of steam through the pipe 10 and its branches will be directed toward the base of the ash-pit a slight distance in advance of the bridge-wall.

It is also the intention of the invention to provide a furnace with a lifting door 12, the operating mechanism of which is not shown. This door is at all times left slightly open, and thereby permits a draft over the fire and in connection with the force of heated smoke and steam causes a more even consuming of fume.

The operation of this device is thought to be clearly apparent to those skilled in the art; but it might be mentioned that the steam passing through the pipe 10 and its branches and discharging through the perforated tubes 11 will draw smoke from the fire-box within the ash-pit and there cause it to be thoroughly mixed with steam, when it will pass through the fire-box, over the bridge-wall, and by the regular course through the tubes *a* of the boiler A, where it will be caught by the hood F and carried by the conduit-pipes, radiating therefrom down to the ash-pit again, where it will pass through the same course, and it will be discharged through the nozzles of the branch conduit-pipes above the fire. This operation will continue until the products of combustion become so light that they will pass up the chimney to the atmosphere.

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

1. In combination with a furnace, a boiler therefor, a hood arranged at one end of the boiler, conduits leading from the hood to the ash-pit of the furnace, branch conduits leading from the first-named conduits, the said branches being within the fire-box, discharging-nozzles carried by the branch conduits, the openings of said nozzles being of various sizes.

2. In combination with a furnace, a boiler, a hood arranged at one end of the boiler, conduits leading from the hood to the ash-pit of the furnace, means for creating a draft through said conduit, and means for discharging steam within the ash-pit, said discharge being directed toward the base of the ash-pit and slightly in advance of the bridge-wall.

3. In combination with a furnace, a boiler therefor, a hood arranged at one end of the boiler, conduits leading from the hood to the ash-pit of the furnace, and terminating a slight distance from the bridge-wall, means for creating a draft through said conduits, and means for discharging steam within the ash-pit, said discharge being directed toward the base of the ash-pit and slightly in advance of the bridge-wall.

4. In combination with a furnace, a boiler therefor, a hood arranged at one end of the boiler, conduits leading from the hood to the ash-pit of the furnace, the free portions of the conduits being provided with perforations, means for creating a draft through said conduits, and means for discharging steam within the ash-pit, said discharge being directed toward the base of the ash-pit and slightly in advance of the bridge-wall.

5. In combination with a furnace, a boiler therefor, a hood arranged at one end of the boiler, conduits leading from the hood to the ash-pit of the furnace, branch conduits leading from the first-named conduits, the said branches being within the fire-box, and discharging therein, means for creating a draft through the conduits, and means for discharging steam within the ash-pit, said discharge being directed toward the base of the ash-pit and slightly in advance of the bridge-wall.

6. In combination with a furnace, a boiler therefor, a hood arranged at one end of the boiler, conduits leading from the hood to the ash-pit of the furnace, branch conduits leading from the first-named conduits, the said branches being within the fire-box, discharging-nozzles carried by the branch conduits, means for creating a draft through the conduits, and means for discharging steam within the ash-pit, said discharge being directed toward the base of the ash-pit and slightly in advance of the bridge-wall.

7. In combination with a furnace, a boiler therefor, a hood arranged at one end of the boiler, conduits leading from one end of the hood to the ash-pit of the furnace and extending along the opposite sides thereof, means carried by the conduits within the ash-pit for discharging laterally of the ash-pit, and means intermediate the portions of the conduits arranged along the side of the ash-pit for discharging steam to the bottom of the ash-pit at a point slightly in advance of the bridge-wall.

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

THOMAS REES.

Witnesses:

H. L. CLARK,
WILLIAM REES.