

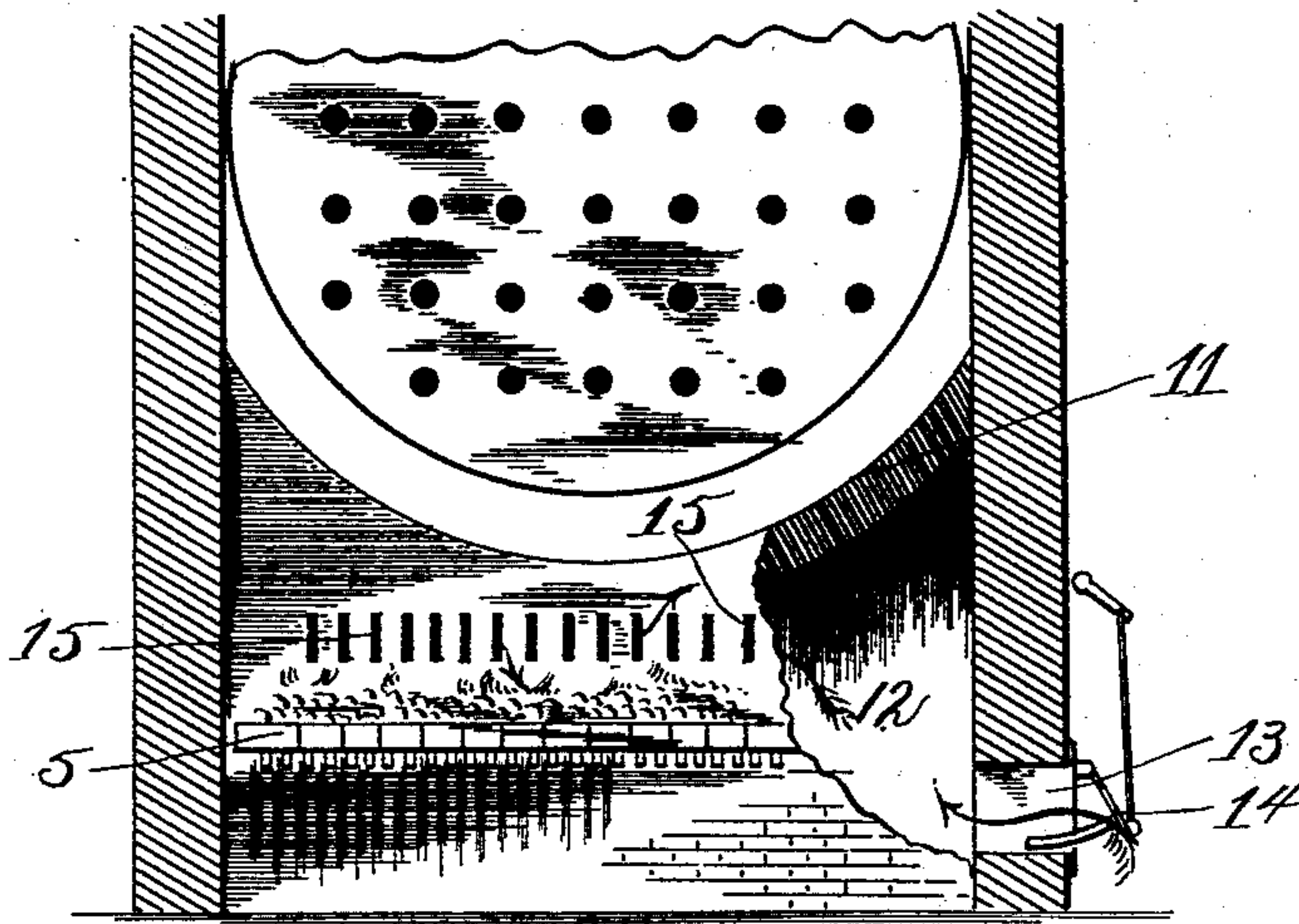
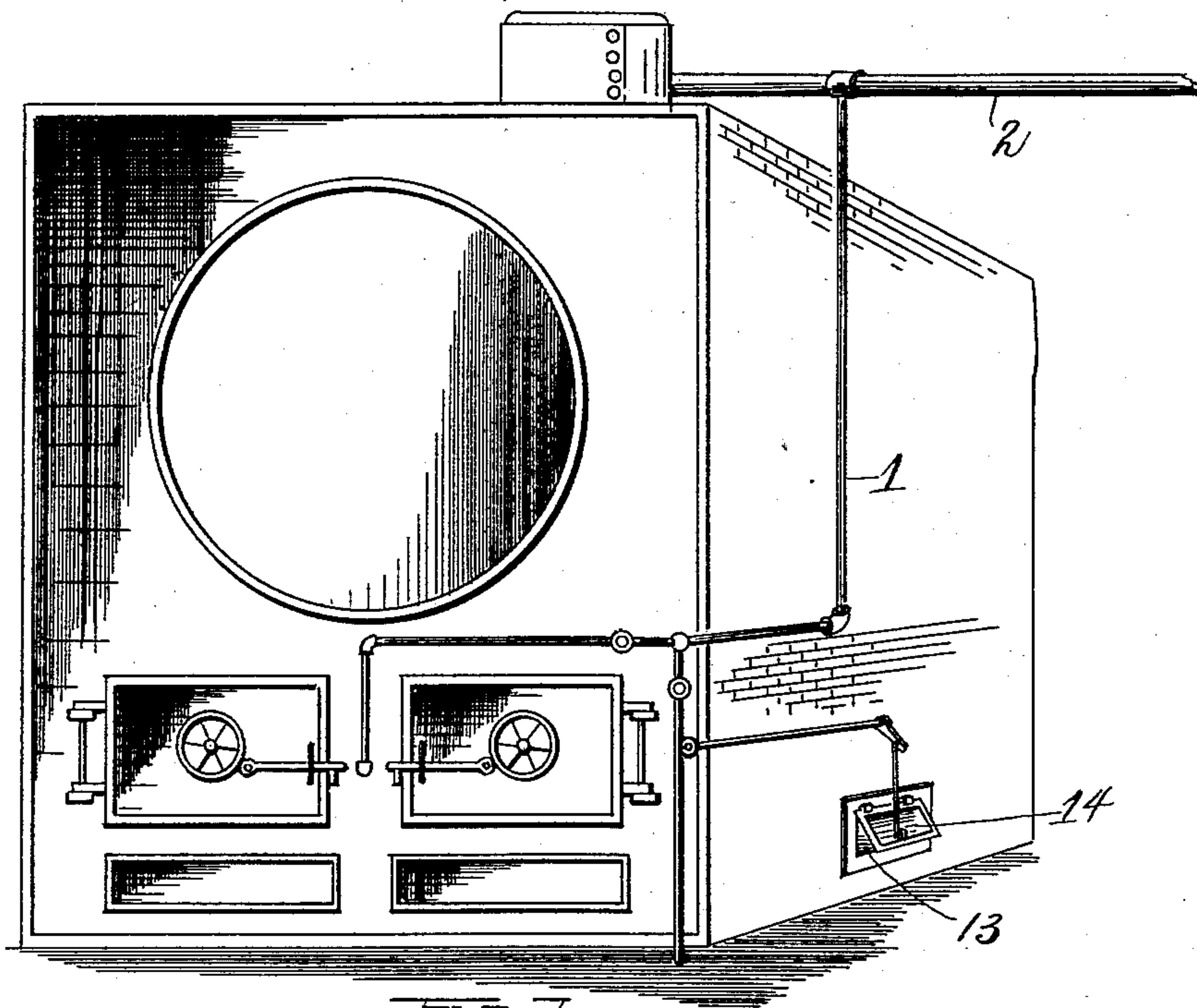
(No Model.)

2 Sheets—Sheet 1.

J. M. KOHNE.
SMOKE CONSUMER.

No. 570,731.

Patented Nov. 3, 1896.



WITNESSES

Carl Heller.

Carroll J. Webster

INVENTOR

John W. Kohne

By William Webster
Atty.

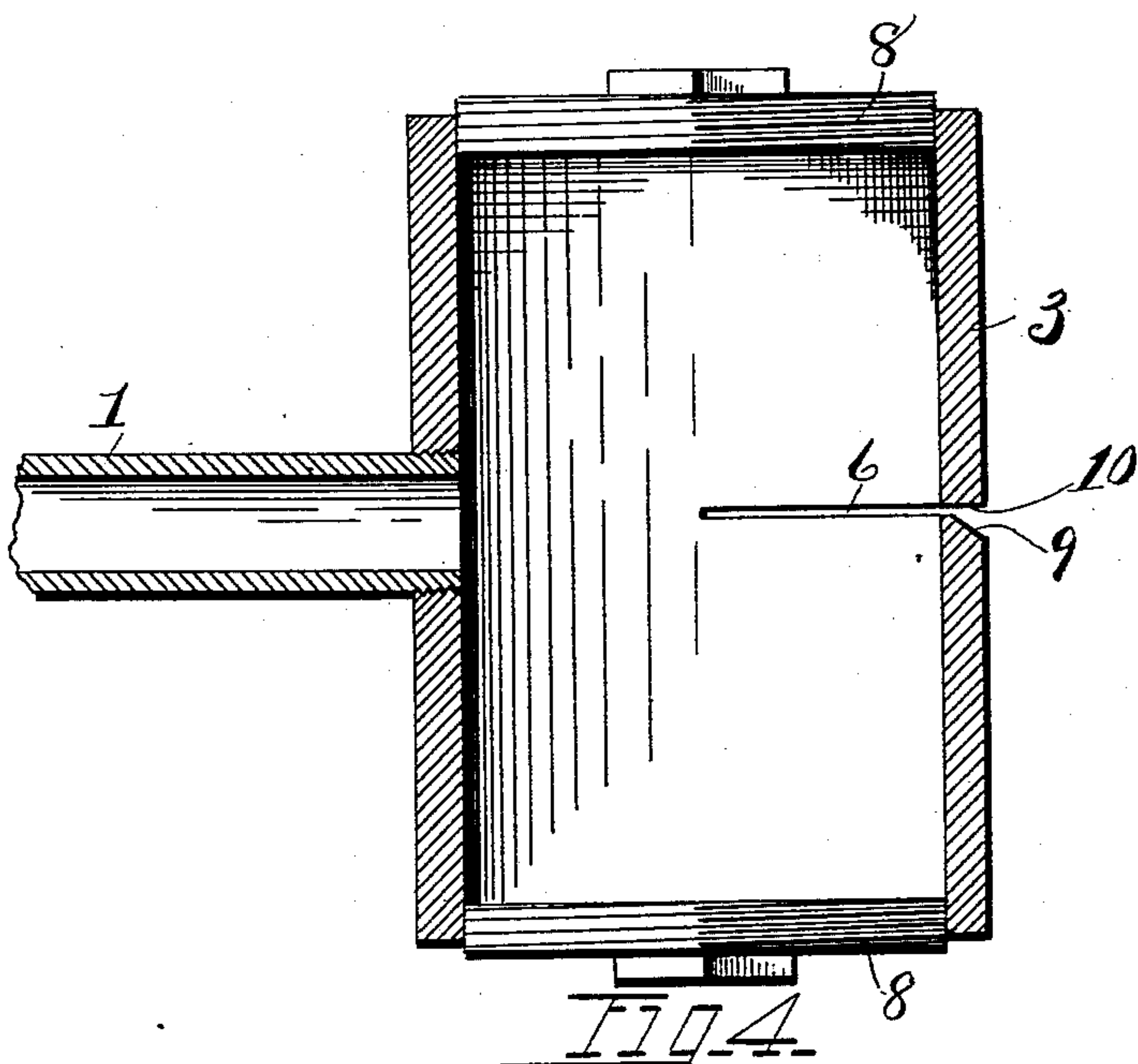
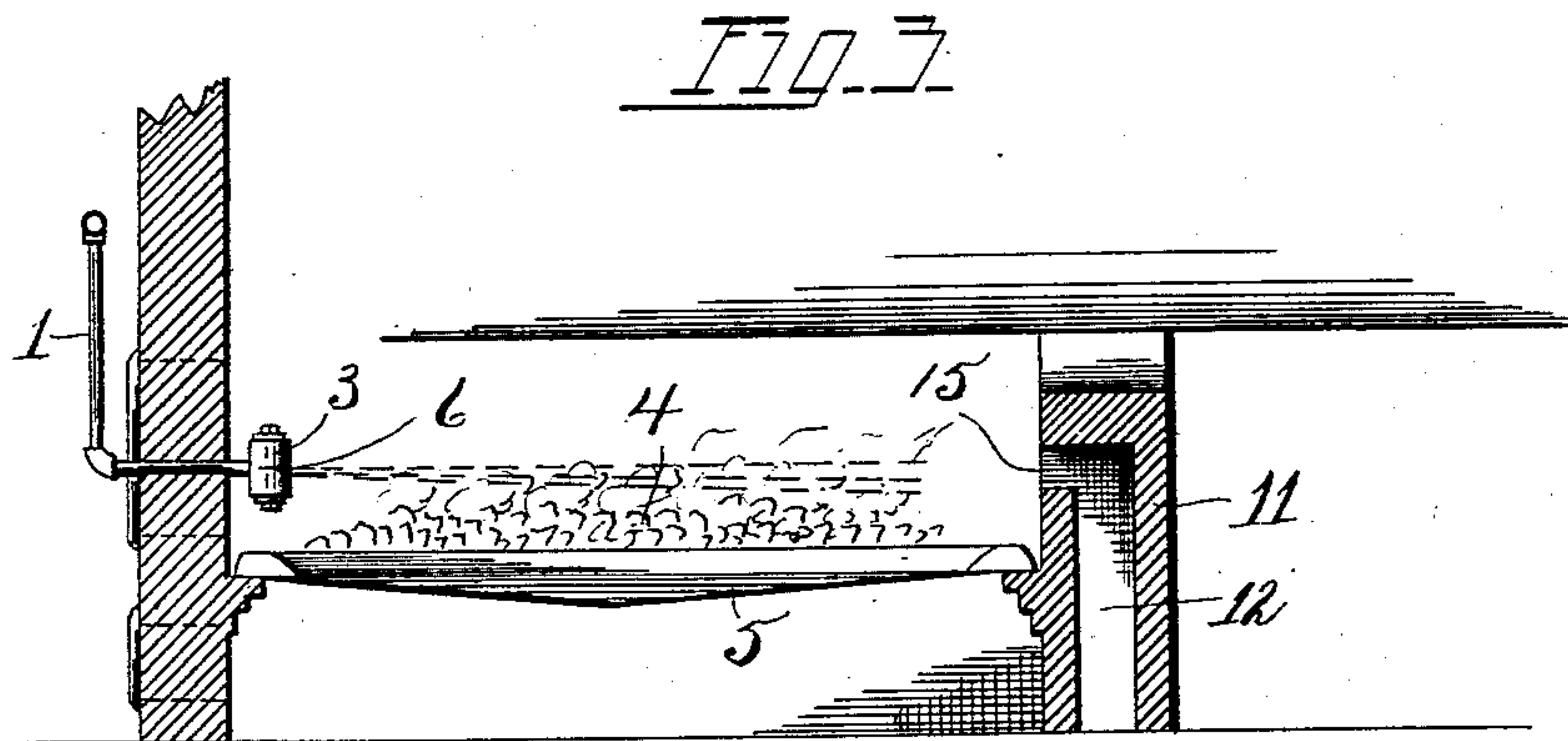
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WITNESSES
Carl H. Keller.
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UNITED STATES PATENT OFFICE.

JOHN M. KOHNE, OF TOLEDO, OHIO.

SMOKE-CONSUMER.

SPECIFICATION forming part of Letters Patent No. 570,731, dated November 3, 1896.

Application filed April 8, 1896. Serial No. 586,669. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. KOHNE, of Toledo, county of Lucas, and State of Ohio, have invented certain new and useful Improvements in Smoke-Consumers; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form part of this specification.

My invention relates to a smoke-consumer, that is to say, a system of superheating steam and projecting the same horizontally across the incomplete products of combustion as they arise from the mass of fuel upon the grate-bars with a volume of superheated air introduced from the opposite direction at the point of greater heat and which intimately commingles with the superheated steam, the two uniting as an oxyhydrogen vapor or gas with the carbon and forming a combustible gas which is entirely consumed, as contradistinguished from escaping through the smoke-stack and going to waste.

My invention is illustrated as connected with and is especially adaptable for use in connection with furnaces for steam-boilers.

In the drawings, Figure 1 is an elevation of a steam-boiler and setting, showing a preferred form of piping for steam and also a preferred arrangement for controlling the ingress of air. Fig. 2 is a sectional elevation of the end, showing the perforations in the bridge-wall and the ingress-ports for introducing air into the hollow bridge-wall. Fig. 3 is a longitudinal vertical section showing the superheater-injector and the hollow bridge-wall and ports. Fig. 4 is a central longitudinal vertical section of the superheater-injector.

In carrying out my invention I introduce live steam through a pipe 1 (either tapped into a steam pipe 2 or connected directly with the steam dome or boiler) into a superheater 3, located in the furnace above the bed of coals 4 upon the grate-bars 5. Centrally of the length of the superheater is a transverse slit 6, extending one-half of the diameter of the

superheater, and through which the superheated steam finds egress in a projected spray radiating from the superheater across the body of fuel upon the grate-bars, and intimately commingles with the superheated air as it issues from the openings in the bridge-wall. The steam is heated to a degree within the superheater to thoroughly disintegrate the same and convert it into a gas, which, with the incorporation of the superheated air, supplies a sufficient amount of oxygen to the hydrogen of the gas evolved from superheating the steam to, when commingled with the carbon of the escaping incomplete products of combustion, effect a secondary combustion, which practically consumes all of the combustible properties combined with the escaping smoke of the furnace. Superheater 3 is preferably tubular and tapped centrally of its length to receive the steam-pipe, having screw-threads upon the interior to receive screw-threaded plugs 8 to close the ends, or the shell may be cast with one solid end, if desired. I prefer, however, to use tubing and screw-threaded ends, as shown.

In practice I have found that to incline the wall of the shell from the lower side of the cut, as at 9, leaving the projecting wall horizontal, tends to deflect the jet downwardly upon the initially-rising incomplete products of combustion and effect a more intimate commingling therewith.

The bridge-wall 11 is formed with a chamber 12, into which air is introduced through an opening 13 in the wall and regulated by a damper 14, the heated air finding egress through ports 15, formed in the front side of the bridge-wall in approximate horizontal alinement with the jet of the superheater, so that the superheated air is projected upon a level with the jet of gas from the superheater-jet to commingle therewith.

It will be seen that I have provided for a union with the carbon escaping of a supply of gas to unite therewith, whereby the same is consumed and unites with the carbonic volume of fuel upon the grate-bars.

Another feature of great value in the use of the system described is the fact that in the perfect combustion insured the usual deposit of soot within the flues is avoided, with the

advantage of lessening the danger of burning the flues and reducing the labor of cleaning the same.

, What I claim is—

- 5 In a smoke-consumer, a superheater comprising a hollow chamber located within the fire-chamber in the forward side of the same and formed with a jet-orifice arranged horizontally thereto, the walls of the orifice being
10 parallel with the grate-bars, a hollow bridge-wall having egress-ports upon the front side in alinement with the jet-orifice and means

for inducing air into the hollow bridge-wall, whereby the superheated steam and air are projected toward each other from opposite 15 directions, and in horizontal alinement.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

JOHN M. KOHNE.

Witnesses:

WILLIAM WEBSTER,
WILSON H. BETTS.