

No. 616,727.

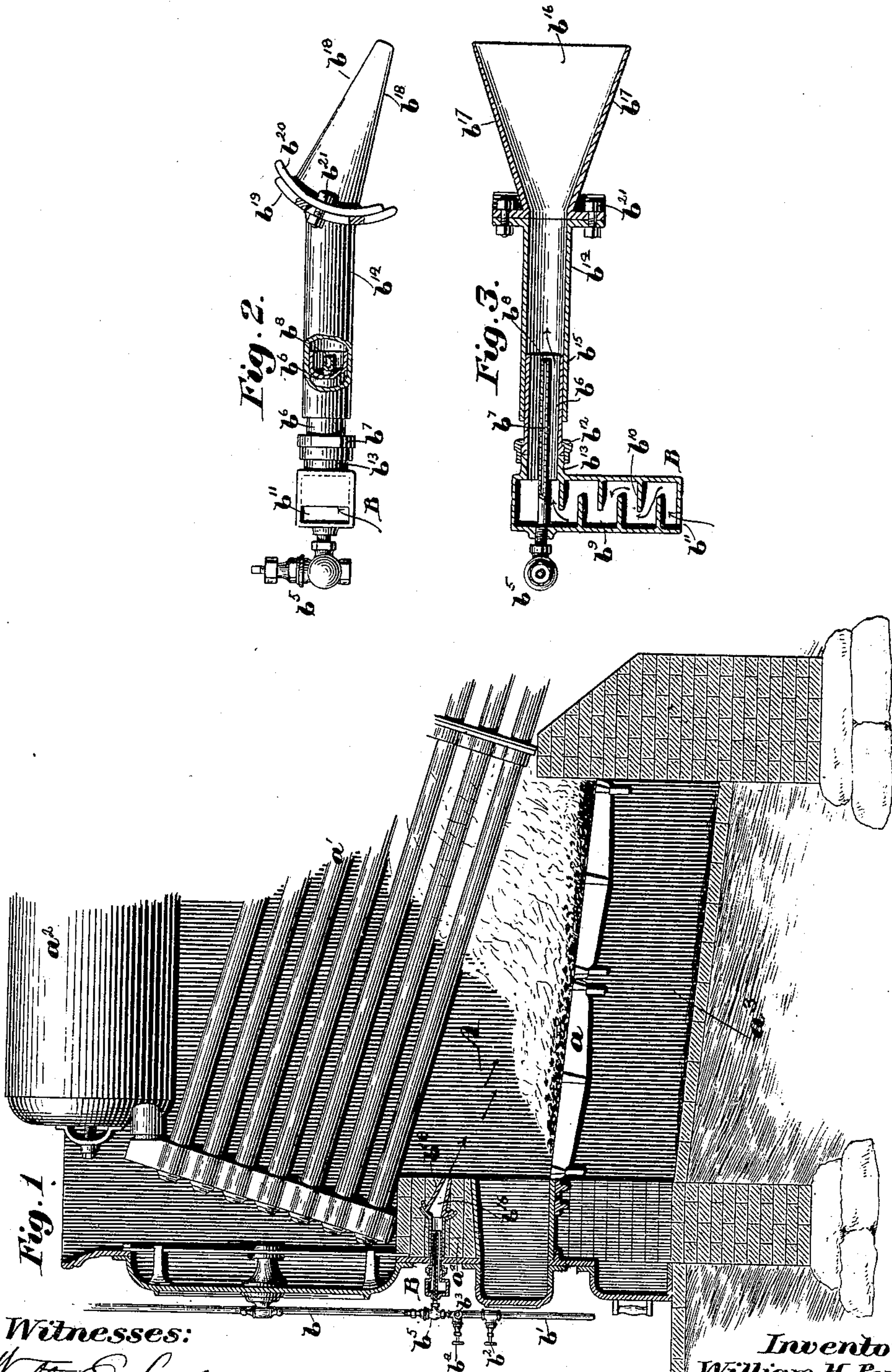
Patented Dec. 27, 1898.

W. H. PERLEY.

SMOKE CONSUMER ATTACHMENT FOR FURNACES.

(Application filed Apr. 1, 1898.)

(No Model.)



Witnesses:
Walter O. Lombard,
Edward F. Allen.

Inventor:
William H. Perley,
by Crosby & Sugony,
Attys.

UNITED STATES PATENT OFFICE.

WILLIAM H. PERLEY, OF LYNN, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE INTERNATIONAL SMOKE CONSUMER COMPANY, OF WEST VIRGINIA.

SMOKE-CONSUMER ATTACHMENT FOR FURNACES.

SPECIFICATION forming part of Letters Patent No. 616,727, dated December 27, 1898.

Application filed April 1, 1898. Serial No. 676,060. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. PERLEY, of Lynn, county of Essex, and State of Massachusetts, have invented an Improvement in Smoke-Consumer Attachments for Furnaces, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention is an improvement in smoke-consumers, having for its object the provision of means for consuming the smoke and at the same time economizing the consumption of the fuel by the heat developed in the process of the smoke consumption, my invention also including means for deadening the noise usually accompanying this class of devices, and also includes further improvements, which will be mentioned and explained hereinafter. In general my invention comprises an elongated steam-jet so constructed and arranged as to draw in a blast of air and mingle the steam and air at a superheating point for the generation of gases, capable of insuring perfect combustion, which are thence delivered by an adjustably-jointed deflector to the best advantage for the particular furnace, the suction of air taking place through an interrupted passage which breaks the vibrations and prevents the objectionable roar and noise heretofore attendant upon smoke-consumers of this class.

The details of construction of my invention and the operation and further advantages thereof will appear more fully in the course of the following description, and the invention will be more particularly defined in the appended claims, reference being had to the accompanying drawings, also forming part of this specification.

In the drawings, in which I have shown a preferred embodiment of my invention, Figure 1 is a vertical longitudinal section of a furnace provided with my apparatus, the latter being shown in central vertical longitudinal section. Fig. 2 is a side elevation thereof, parts being broken away in order more clearly to show the construction. Fig. 3 is a central horizontal section thereof.

The furnace A, having a grate a , steam-

pipes a' , boiler a^2 , and ash-pit a^3 , may be of any usual or preferred kind, my invention being intended for use with any furnace, heater, or other source of fuel combustion.

The smoke-consumer B is herein shown as located in the head a^4 of the furnace or boiler and is connected by a pipe b with the dome of the boiler or other source of steam-supply under pressure, a drip-pipe b' and cock b^2 being provided in order that dry steam may be had, if required, and the one or more smoke-consumers, as desired, receive their steam-supply from a supply-pipe b^3 , provided with a supply-valve b^4 , and preferably also each provided with a regulating-valve b^5 . The steam from the supply-pipe b^3 passes through the regulating-valve b^5 within a discharge-chamber b^6 , in which is concentrically extended a discharge-nozzle b^7 , which has an opening end b^8 , terminating a considerable distance within the discharge-chamber, for a purpose presently to be explained. At its outer end the discharge-chamber b^6 is provided with an air-box b^9 , shown as laterally extended and provided on its inner walls with a plurality of interrupted diaphragms or staggered partitions b^{10} , the air having access to the air-box at b^{11} .

Referring further to Fig. 3, it will be seen that the discharge-chamber b^6 is secured for convenience by a shouldered nut or union b^{12} to a nipple b^{13} on the air-box and that it has an extension b^{14} , shown as telescopically mounted on its inner or forward end at b^{15} , this provision being a preferable one for the purpose of enabling the apparatus to be accommodated to varying thicknesses of furnace-walls or to other conditions. At its forward end the discharge-chamber carries an adjustable deflector b^{16} , flared at its horizontal sides, as indicated at b^{17} , Fig. 3, and converging at its top and bottom sides, as shown at b^{18} , Figs. 1 and 2. This deflector is adjustable angularly with relation to the discharge-chamber in order that the steam and air may be properly commingled and directed at the precise part of the fire-box where it will be of the most service. As herein shown, this adjustment is attained by providing the discharge-chamber with curved upper and lower wings b^{19} ,

receiving reversely-curved flanges b^{20} on the adjacent end of the deflector, one or both of these being slotted to receive fastening-bolts b^{21} for clamping the deflector in any adjustment.

My aim in this device has been to provide means for producing more perfect combustion than has been possible hitherto, and I have found that by extending the discharge-nozzle a considerable distance within the heated portion of the discharge-chamber the air and the superheated steam, coming together, as they necessarily do under such circumstances, in an exceedingly-hot chamber and then impinging against the top wall b^{18} of the deflector and being directed by the adjustable deflector in the precise direction and portion of the fire-box where they will meet the products of combustion to the best advantage, develop combustible gases to a remarkable extent and perfection; also, I have found that by providing the free end of the discharge-nozzle entirely open and preferably slightly flared, as shown at b^8 , there is a superior spraying effect and the discharge-nozzle is automatically maintained open and clear of foreign clogging matter. This is of special advantage in a device of this kind, and I find that it materially enhances the free and uniform working of my smoke-consumer. Leaving the discharge-nozzle entirely open permits the discharge of the steam without hindrance, so that it has no tendency to condense, and also it has a superior force, the result being that when the commingled air and dry steam strike forcibly against the opposing wall of the deflector a dry spray is driven out over the fire in a most effectual manner.

I wish also to lay especial emphasis upon the air-box feature of my improved smoke-consumer. As is well known by all who are practically conversant with these matters, the noise of the injector type of smoke-consumers is exceedingly objectionable, and accordingly the removal of this noise is of great advantage and value. By providing the interrupted passage-way for the entrance of the air as it is sucked in by the steam-blast this noise is stopped and the apparatus works substantially noiselessly.

By adjusting the regulator b^5 the proportion and amount of steam and air may be varied as desired, and it is to be noted that the relations of the parts, particularly the location of the valve b^5 , are such that the steam is without interruption or tendency to condense, so that a cutting down of the amount of steam does not produce a wet steam, but leaves the dry-steam blast the same as before. This is of considerable advantage.

Various changes in details of construction and combinations of parts may be resorted to within the spirit and scope of my invention.

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

1. In a smoke-consumer, a discharge-chamber, a deflector at the inner end of said chamber, said deflector being jointed to said chamber and angularly adjustable relatively thereto, and a discharge-nozzle for discharging steam within the said chamber and against the deflector, substantially as described.

2. A smoke-consumer, comprising a discharge-chamber, an air-box supplying air thereto, and a discharge-nozzle for steam centrally located within said discharge-chamber, and a deflector at the inner or forward end of said discharge-chamber, said deflector and chamber containing mechanism for the angular adjustment of the deflector relatively to the chamber, substantially as described.

3. A smoke-consumer, comprising a discharge-chamber, a steam-nozzle concentrically located therein, and a deflector adjustably jointed to the inner end of said chamber, said deflector having flared side walls and converging top and bottom walls, the top wall thereof being in line with said steam-nozzle, and said steam-nozzle having an uninterrupted passage and outlet extending to and including its inner extremity, whereby the steam is free to discharge with uninterrupted force directly against said top wall, substantially as described.

4. A smoke-consumer, comprising a discharge-chamber, an air-box supplying air thereto, a discharge-nozzle for steam centrally located within said discharge-chamber, and a deflector detachably and adjustably secured at the inner or forward end of said discharge-chamber, substantially as described.

5. In a smoke-consumer, the combination with a steam-discharge nozzle, and a surrounding chamber to receive air for mingling with the steam from said nozzle, of an air-box surrounding said nozzle for the delivery of air to said chamber, said box having an air-opening at its free end and containing closely-arranged staggered partitions for interrupting the rush of air to said chamber, substantially as described.

6. In a smoke-consumer, the combination with a steam-discharge nozzle, and a surrounding chamber to receive air for mingling with the steam from said nozzle, of an air-box surrounding said nozzle for the delivery of air to said chamber, said box having an air-opening at its free end and containing closely-arranged staggered partitions for interrupting the rush of air to said chamber, and a deflector adjustably jointed to the inner end of said discharge-chamber opposite said air-box, said deflector being in line with the discharge from said discharge-nozzle, substantially as described.

7. A smoke-consumer, comprising a discharge-chamber to be built into the wall of a furnace, said chamber including an outer part, and an inner part or extension b^{14} telescopically mounted on said outer part, a discharge-nozzle for discharging steam within said chamber, a steam-supply pipe for said nozzle,

a regulating-valve b^5 connecting said supply-pipe and nozzle, and a drip-pipe extending below said valve b^5 , whereby condensations of steam by partially closing said valve are directed away from the discharge-nozzle and the latter receives a uniform quality of steam, substantially as described.

8. A smoke-consumer, comprising a discharge-chamber to be built into the wall of a furnace, said chamber having a deflector adjustably jointed thereto at its inner end, a discharge-nozzle for discharging steam within said chamber, a steam-supply pipe for said nozzle, a regulating-valve b^5 connecting said supply-pipe and nozzle, and a drip-pipe extending below said valve b^5 , whereby condensations of steam due to partially closing said valve are directed away from the discharge-nozzle and the latter receives a uni-

form quality of steam, substantially as described.

9. A smoke-consumer, comprising a discharge-chamber to be built into the wall of a furnace, said chamber including an outer part, and an inner part or extension b^{14} telescopically mounted on said outer part, said chamber having a deflector adjustably jointed thereto at the inner end of said extension, and a discharge-nozzle for discharging steam within said chamber against said deflector, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WM. H. PERLEY.

Witnesses:

JOHN COUPER EDWARDS,
AUGUSTA E. DEAN.