

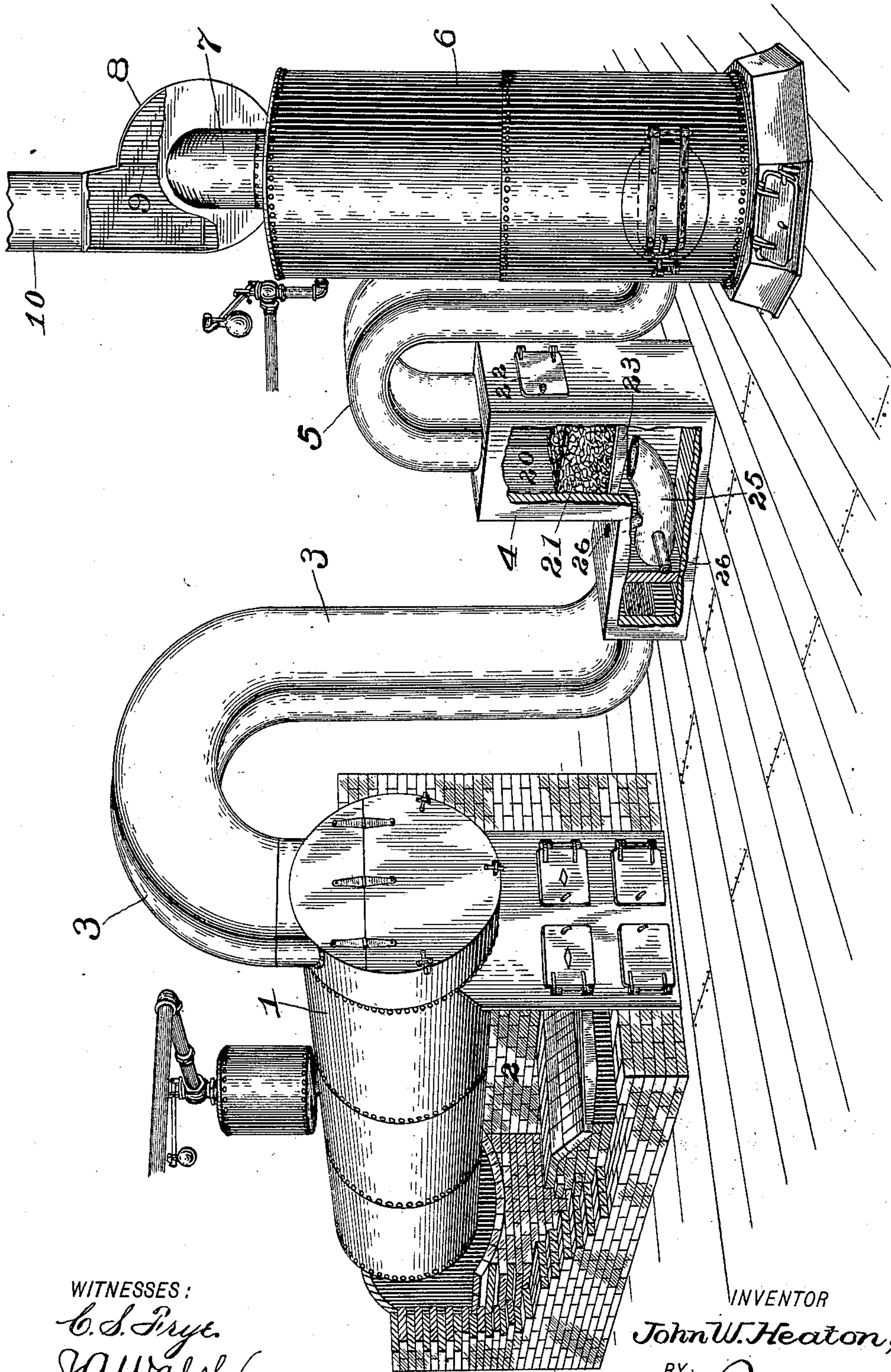
No. 674,337.

Patented May 14, 1901.

J. W. HEATON.  
SMOKE CONSUMER.

(Application filed June 11, 1900.)

(No Model.)



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

JOHN W. HEATON, OF INDIANAPOLIS, INDIANA, ASSIGNOR OF ONE-HALF TO  
AUGUSTIN BOICE AND JOSEPH K. SHARPE, JR., OF SAME PLACE.

## SMOKE-CONSUMER.

SPECIFICATION forming part of Letters Patent No. 674,337, dated May 14, 1901.

Application filed June 11, 1900. Serial No. 19,795. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN W. HEATON, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Smoke-Consumers, of which the following is a specification.

The object of my invention is to consume the black smoke which comes from the combustion-chamber of ordinary furnaces and the like and which is due to imperfect combustion.

It consists, generally speaking, in a means for forcing said smoke through a second (preferably practically smokeless) fire, by which those elements not previously consumed in the primary combustion-chamber are completely consumed and the heat therefrom utilized.

An apparatus embodying my said invention will be first fully described and the novel features thereof then pointed out in the claims.

The accompanying drawing, which is made a part hereof and on which similar reference characters indicate similar parts, is a perspective view of an apparatus illustrating my said invention, certain portions being broken away to show parts of the interior.

In said drawing there is shown an ordinary steam-boiler 1, below which is the usual combustion-chamber 2, where the fuel is placed in the ordinary manner, and the smoke and other products of combustion pass thence through the flues in the boiler to a smoke-pipe 3. This smoke-pipe instead of being connected with a chimney or smoke-stack, as is usual, runs to a second furnace 4, in which the smoke is to be consumed. A smoke-pipe 5 runs thence to a second steam-boiler 6, from which the smoke-pipe 7 I prefer to run to the eye of the casing 8 of a suction-fan 9, the egress-passage from which develops into an ordinary smoke-stack 10.

While steam-boilers are shown, my invention is of course equally applicable to any other furnaces or heaters, and such are to be understood as within the scope of my invention.

Returning now to the smoke-consuming furnace 4. This contains a combustion-cham-

ber 20, into which a suitable body 21 of fuel, as coke, is fed through a suitable door 22, said fuel resting upon grate-bars 23. The passage through the pipe 3 is of considerable capacity—ample to take all the products of combustion in substantially the condition in which they leave the combustion-chamber wherein they are generated. Just before they reach the fire in the smoke-consuming furnace 4, however, they are forced into a smaller compass or condensed by means of a smaller pipe 25, which is substantially a nozzle to said pipe 3 and the open end of which is positioned directly below the grate-bars 23, so that as the smoke emerges from said pipe 25 it will strike said grate-bars and pass up through them and through the flue thereon, as will be readily understood. Being, as above stated, considerably condensed, the smoke is in good condition to be consumed, and the body of fuel 21 being kept in a high state of combustion, as will be presently described, said smoke is thoroughly consumed or, in other words, the combustion of the fuel is completed and perfected. In order to supply the fire in the smoke-consuming furnace 4 with sufficient air, small ingress-tubes 26 lead from the pipe 25 through the casing of said furnace 4 to the outer air. As shown, these pipes are set in an angling direction with their mouths farther back than the ends which enter the pipe 25, so that there will be no tendency of the smoke to be forced out through them, the movement being in the other direction.

As above stated, the fuel in the smoke-consuming furnace is preferably coke, which does not give off smoke. Other solid fuel might be used with some degree of success, although not as suitable for the purpose, and any gaseous fuel, by a suitable arrangement of burners, may be employed. Electric heat might also by suitable appliances be used for the purpose.

As heretofore stated, the pipe 5 from the smoke-consuming furnace leads to a second boiler 6. The heat from the products of combustion is thus fully utilized and substantially the same result is attained as though a perfect combustion were had in the furnace of the ordinary boiler 1, while the same heat



utilized in the primary furnace is also to a considerable extent reused in the second furnace.

In order to produce sufficient draft to accomplish my object, I employ the suction-fan 9, above mentioned, which draws with a steady and powerful force the products of combustion from the furnace 2 up through the pipe 3 and through the smoke-consuming furnace 4 and its pipe 5 and the second boiler 6, the result being that not only is perfect combustion obtained, but a sufficient draft is provided to secure uniform and proper results in the primary combustion-chamber.

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

1. In a smoke-consuming apparatus, the combination, of a combustion-chamber, a separate smoke-consuming furnace, a pipe for the passage of the products of combustion leading from above the fire of the first to below the fire of the latter, said pipe being near its point of discharge formed tapered to a reduced size at said point, a second heater, a

pipe leading from said separate smoke-consuming furnace to said second heater, means for supplying the separate smoke-consuming furnace with air, and means for creating the necessary draft, all substantially as set forth.

2. In a smoke-consuming apparatus, the combination of a combustion-chamber, a separate smoke-consuming furnace, a pipe for the passage of the products of combustion leading from above the fire of the first to below the fire of the latter, said pipe being reduced in size at its point of discharge, and provided with intake-pipes near its discharge end, which lead to the outside air, and a pipe leading from said furnace and provided with means for creating the necessary draft, substantially as set forth.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 9th day of June, A. D. 1900.

JOHN W. HEATON. [L. S.]

Witnesses:

CHESTER BRADFORD,  
JAMES A. WALSH.