

(No Model.)

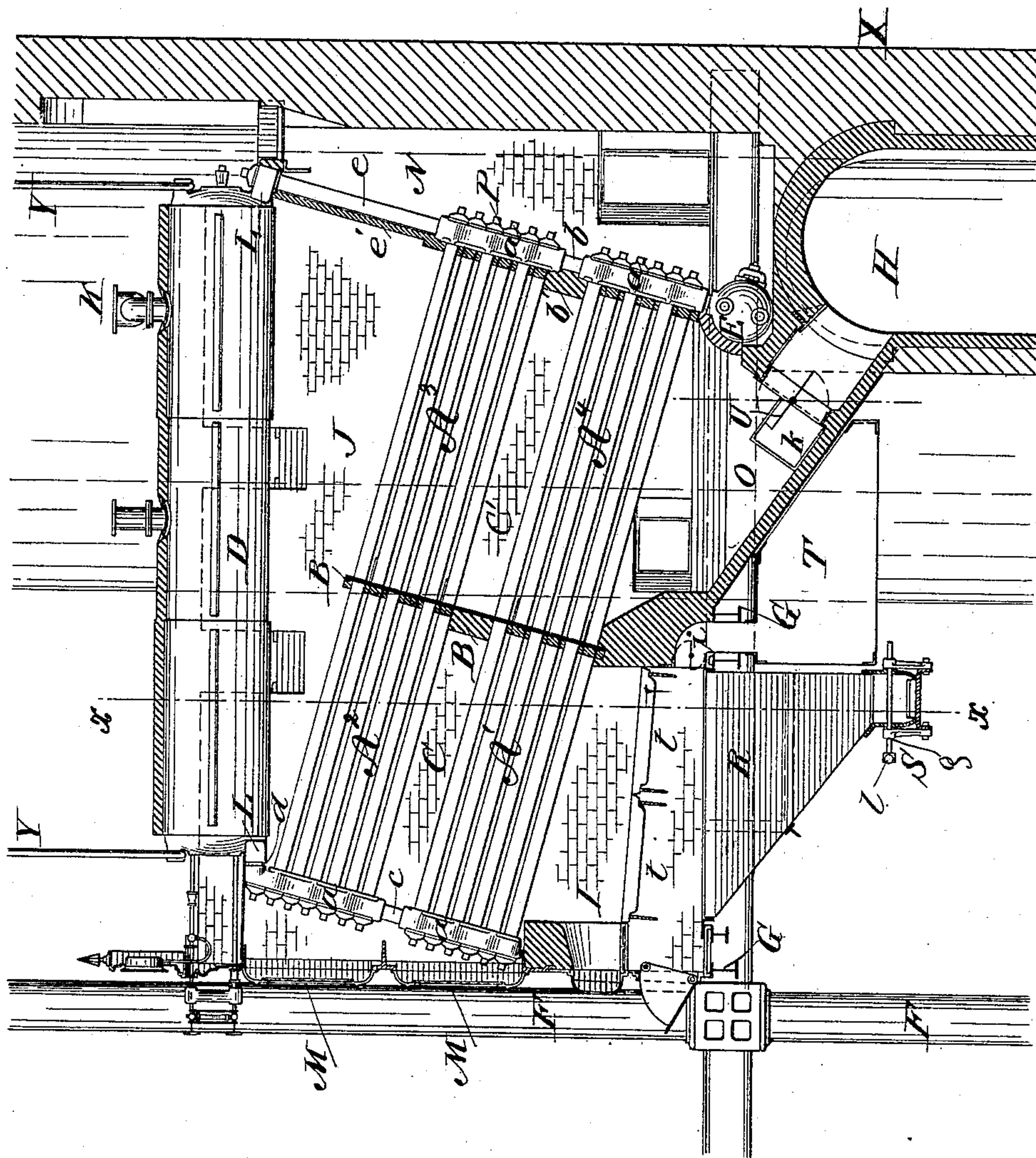
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N. W. PRATT.
STEAM GENERATOR.

No. 428,631.

Patented May 27, 1890.

Fig. 1.



WITNESSES.

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(No Model.)

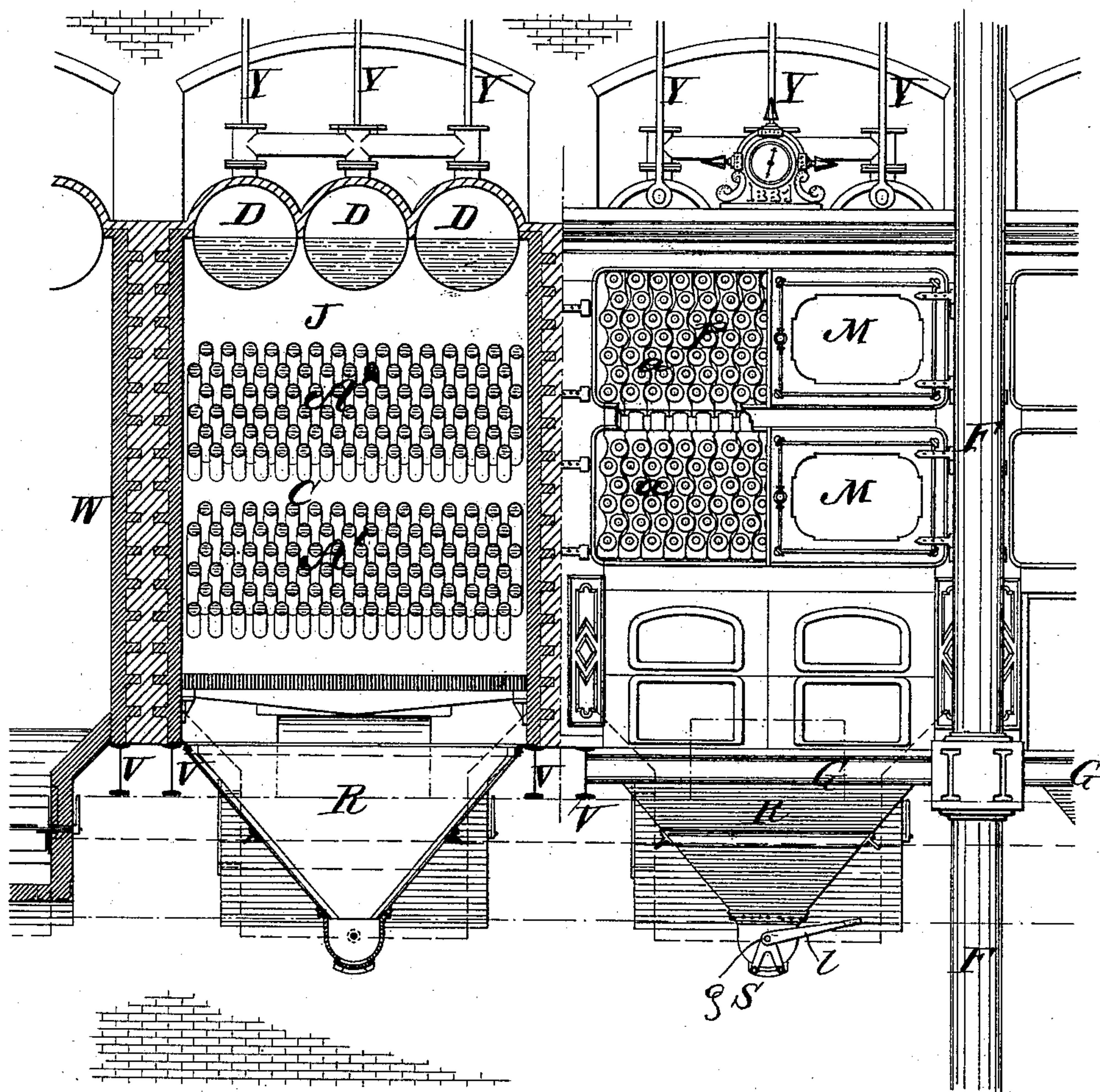
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N. W. PRATT.
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Fig. 2.



WITNESSES.

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UNITED STATES PATENT OFFICE.

NAT. W. PRATT, OF BROOKLYN, NEW YORK.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 428,631, dated May 27, 1890.

Application filed January 28, 1888. Serial No. 262,210. (No model.)

To all whom it may concern:

Be it known that I, NAT. W. PRATT, a citizen of the United States, residing at Brooklyn, county of Kings, State of New York, have
5 invented certain new and useful Improvements in Steam-Generators, of which the following is a specification.

This invention relates to sectional water-tube steam-boilers wherein the heated furnace-gases are passed between ranges of
10 steam-generating tubes in a direction transverse to the tubes.

In order to enable others to understand and use my said invention, I will proceed to describe the details of its construction, and subsequently point out in the appended claims
15 its novel characteristics.

Referring to the accompanying drawings, in which corresponding letters indicate like parts, Figure 1 is a longitudinal vertical section of a boiler constructed according to my
20 invention, and Fig. 2 a front elevation partly in section on the line $x x$ of Fig. 1.

$A' A^4$ and $A^2 A^3$ are groups of generating
25 water-tubes all connecting vertically by serpentine headers a at each end thereof, and by means of nipples b and c with one another, and by nipples d and ranges of tubes e with the manifolds L of the steam-drums D .

$C C'$ are the combustion spaces or chambers between the said groups of generating-tubes, the same, as well as the interstices between the tubes, being divided by the central diaphragm B , faced with fire-brick or other suitable material, and extending transversely
30 throughout the breadth of the boiler-space. The range of heating-surface may be extended by the employment of additional groups of tubes and combustion-spaces, the invention
40 not being limited to the number shown.

The serpentine headers a interlock, as seen in Fig. 2, and form walls within which the draft-course is confined, the spaces between the nipples b and series of tubes e being closed
45 by fire-brick filling b' and e' , and in the instance of the opposite ends of the structures the draft being confined by the boiler-fronts and doors M . The draft-course is therefore directed upward from the furnace I , through
50 the tubular groups $A' A^2$ and intervening combustion-space C , through the combustion-space J , (as in common practice,) thence down-

ward through the tubular groups $A^3 A^4$ and intervening combustion-space C' to the point of delivery H , which latter in the present instance of a battery of boilers traverses beneath the entire number, subsequently conducting to the stack or chimney.

The space N , back of each boiler independent of the draft-passages, serves the purpose
60 of access to the hand-holes P opposite the tubes, whereby the products of cleaning are readily removed.

The water-tubes are inclined at substantially a common angle, in the manner usual in
65 boilers of this class, so that upward circulation is promoted by the heat delivering the current to the front end of the steam-receiving drum D , thence to the rear and downward through the lower headers a . The mud-drum
70 E , connecting transversely beneath the said lower header and having suitable blow-off appliances, receives such water impurities as are separated by gravitation.

K are the steam-pipes connecting the drums
75 D together and with the point of steam-delivery.

From the hoppers or reservoirs $R R$ beneath the furnace ash-pits the accumulated ashes are removed by the lever-operating
80 dumping device S , consisting of a swinging lid pivoted at g and operated by the lever l .

T are receiving-chambers of suitable blowers, (not shown,) from which air-blast is admitted through dampers i to and beneath the
85 grate-bars t to controllably accelerate the draft.

U is a regulating-damper, which may be automatically or otherwise regulated to control the draft at its point of exit. The delivery-flue
90 O conducting to the main flue H is of a hopper shape, having inclined sides, and by closing the damper U acts as a receptacle for products of cleaning from the flues and chambers above, said products being removed
95 through the door k adjacent to said damper by a suitable implement introduced from the side.

The boiler-setting herein shown is especially adapted to the location of batteries of
100 boilers in the successive stories of a building one above another. The walls W are sustained upon the I -beams V , carried from the pillars F to and into the walls X , as the side

or partition walls of the building. The transverse I-beams G, extending between the beams V, sustain the furnace front-wall and bridge-wall, as shown, the rear of the tubular structure and the mud-drum being supported by the arch of the smoke-flue H. The steam-drum D is suspended beneath each overhanging floor by rods Y, the weights of the several boiler structures being thus subdivided and distributed.

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

1. In combination with a water-tube steam-boiler having an upward and downward draft across the tubes, a reservoir, ash-pit, a smoke-flue, and a blast-pipe, all arranged substan-

tially as described, and located beneath the boiler-room.

2. The combination, with a boiler-furnace, of a final draft-discharge passage conformed in the shape of a downwardly-converging hopper located below the boiler structure or a portion thereof, said hopper having a closing-plate, such as U, at or near its bottom or outlet, and an auxiliary opening, such as K, whereby the deposits of combustion when removed from the structure above may be collected and withdrawn from the terminus of the hopper when said closing-plate is closed.

NAT. W. PRATT.

Witnesses:

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H. E. BUNKER.