

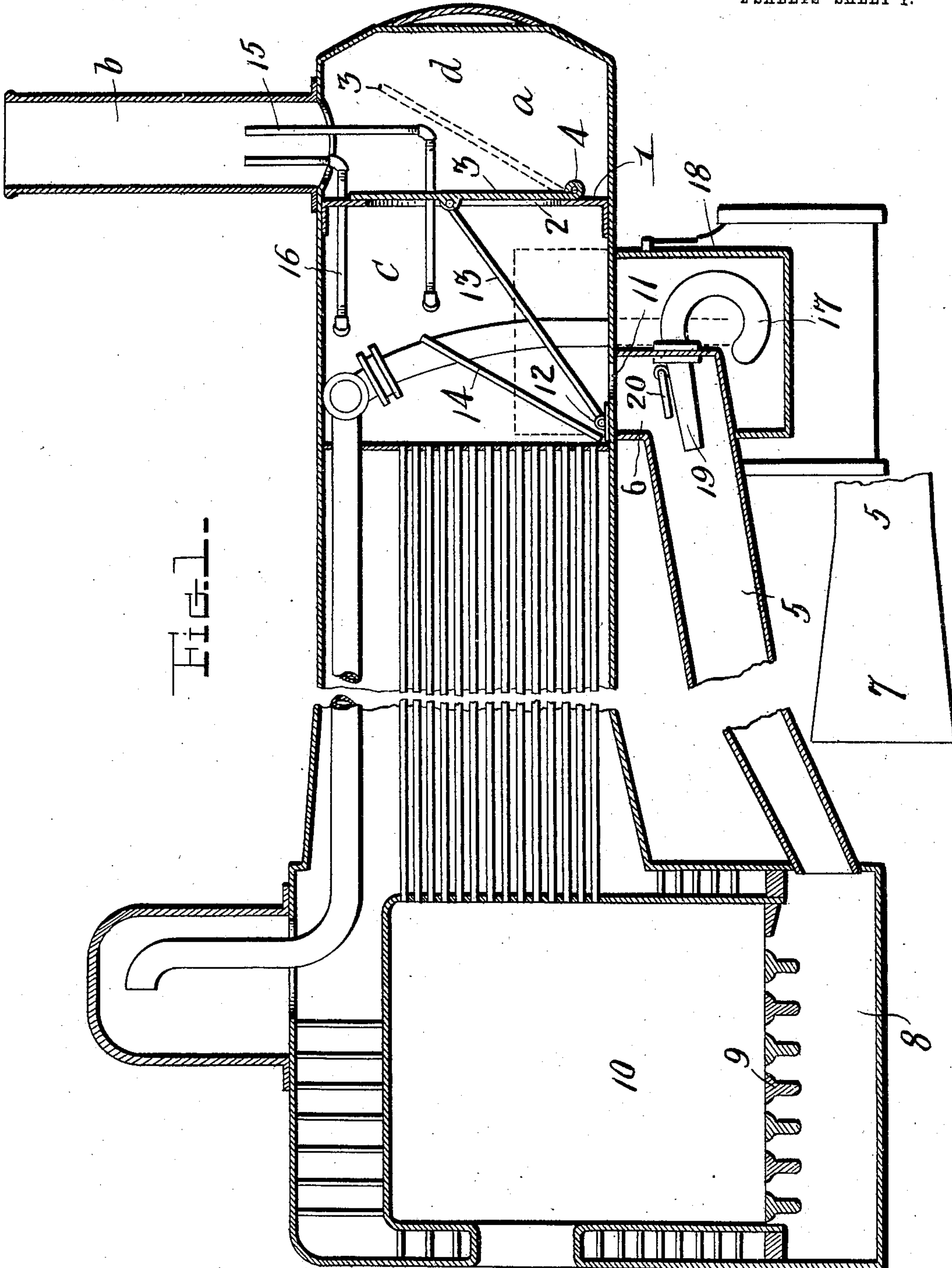
No. 774,297.

PATENTED NOV. 8, 1904.

W. WILEY.
SMOKE CONSUMER.
APPLICATION FILED APR. 7, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses
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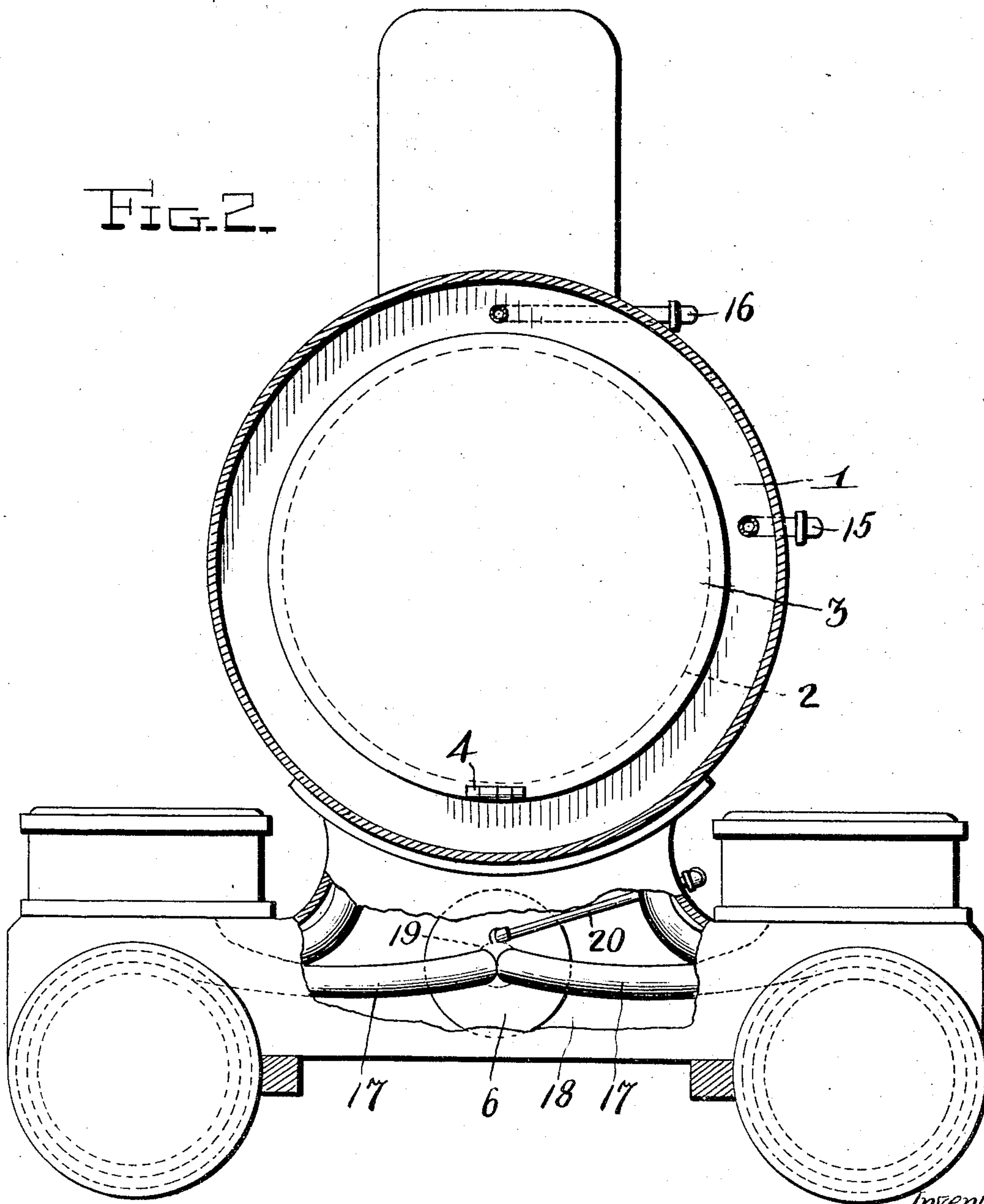
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2 SHEETS—SHEET 2.

FIG. 2.



Witnesses

for A. Kachl.

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UNITED STATES PATENT OFFICE.

WILLIAM WILEY, OF SIOUX CITY, IOWA.

SMOKE-CONSUMER.

SPECIFICATION forming part of Letters Patent No. 774,297, dated November 8, 1904.

Application filed April 7, 1904. Serial No. 202,067. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM WILEY, a citizen of the United States, residing at Sioux City, in the county of Woodbury and State of Iowa, have invented certain new and useful Improvements in Smoke-Consumers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention is an improved smoke-consumer and fuel-economizer for locomotive boiler-furnaces and other boiler-furnaces; and it consists in the construction, combination, and arrangement of devices hereinafter described and claimed.

The object of my invention is to provide means for returning the gases and other products of combustion to a boiler-furnace to secure the entire or nearly entire combustion of the same, thus preventing the escape of smoke into the air and to also effect an economy of fuel.

In the accompanying drawings, Figure 1 is a vertical longitudinal central sectional view of a locomotive-boiler and furnace provided with my improved smoke-consuming and fuel-economizing devices. Fig. 2 is a transverse sectional view of the same.

In the smoke-box *a* of the boiler at a slight distance in rear of the smoke-stack *b* I construct a partition 1, having an opening 2 of suitable dimensions and a closure 3 for the said opening. The said closure is here shown as hinged at its lower side, as at 4. The partition divides the smoke-box into compartments *c* *d*, and the closure regulates communication between the said compartments and the passage of products of combustion from the furnace to the smoke-stack.

On the under side of the boiler is a downwardly and rearwardly inclined flue 5, which is here shown as having at its front end an upwardly-extending elbow 6, joined to the under side of the compartment *c* of the smoke-box. The rear end of the said flue is contracted vertically and widened laterally, as at 7, and communicates with the ash-pit 8 under the grate 9 of the fire-box or furnace 10. An opening 11 is formed in the lower side of the

compartment *c* of the smoke-box, which establishes communication between the said compartment and the return-flue 5. A cut-off slide 12 is disposed in the bottom of the said compartment *c*, is connected to the closure 3 by a rod or similar connection 13, and hence the said cut-off slide is movable with the closure 3, so that as the latter uncovers the opening 2 the cut-off slide correspondingly cuts off communication between the smoke-box and the return-flue through the opening 11, and vice versa.

In the compartment *c* of the smoke-box and in rear of the cut-off slide is a forwardly and upwardly inclined deflecting-plate or baffle 14.

15 represents the exhaust-pipe from the air-pump, and 16 represents the blower-pipe, both of which discharge upwardly in the smoke-stack.

Exhaust-passages 17, which are here shown as in the saddle 18 of the locomotive, lead from the engines to a nozzle 19, which discharges the exhaust-steam from the engines rearwardly into and through the flue 5. A live-steam pipe 20, which leads from the steam-space of the boiler at a suitable point, is also arranged to discharge rearwardly into the flue 5. Suitable valves will of course be provided to control the operation of the blower 19 and of the blower 20.

In the operation of my invention the smoke, gases, and other products of combustion as they issue from the tubes at the head of the boiler impinge against the deflecting-plate 14 and are diverted upwardly thereby into the upper portion of the compartment *c* of the smoke-box, and assuming that the slide 12 is in position to establish communication between the said compartment and the flue 5 and that the engines are discharging their exhaust-steam into the said flue the smoke, gases, and other products of combustion will be forced by the exhaust-steam blast rearwardly through the flue 5 into the ash-pit of the furnace and will be drawn upwardly through the fire and consumed. The exhaust-steam becomes commingled with the smoke and gases while the same are passing through the flue 5 and serves to greatly increase the combustibility thereof.

From the foregoing description, taken in

connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

5 Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

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

15 A furnace having a smoke-box provided with an upright partition having a draft-opening, and an outwardly-opening closure therefor, the outer compartment of the smoke-box communicating with the smoke-stack and the in-

ner compartment of the smoke-box communicating with the boiler-flue and having an upwardly-extending outwardly-inclined baffle, 20 a return-flue leading from the inner compartment of the smoke-box to the ash-pit of the furnace, a cut-off for said return-flue, and means to discharge a steam-blast through the return-flue to the ash-pit of the furnace, substantially as described. 25

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM WILEY.

Witnesses:

J. N. WEAVER,
H. F. SIMS.