No. 703,149. Patented June 24, 1902.

W. McNEIL.

SMOKE CONSUMING ATTACHMENT.

(Application filed July 27, 1901.)

(No Model.)

Fig. 2.

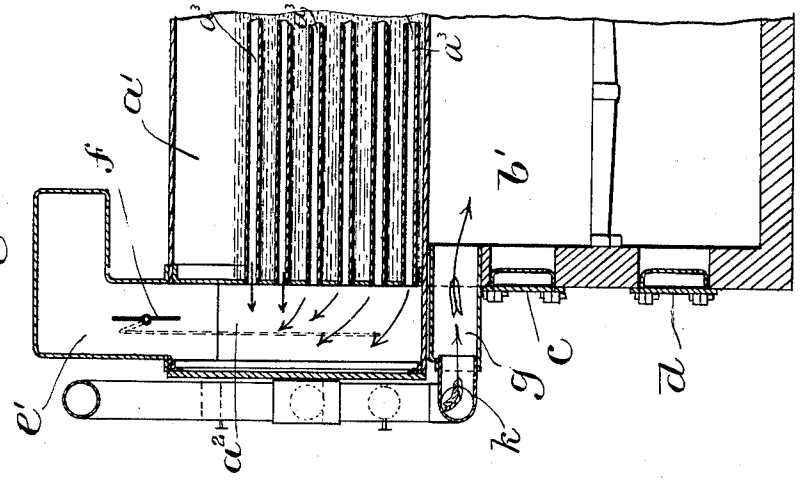
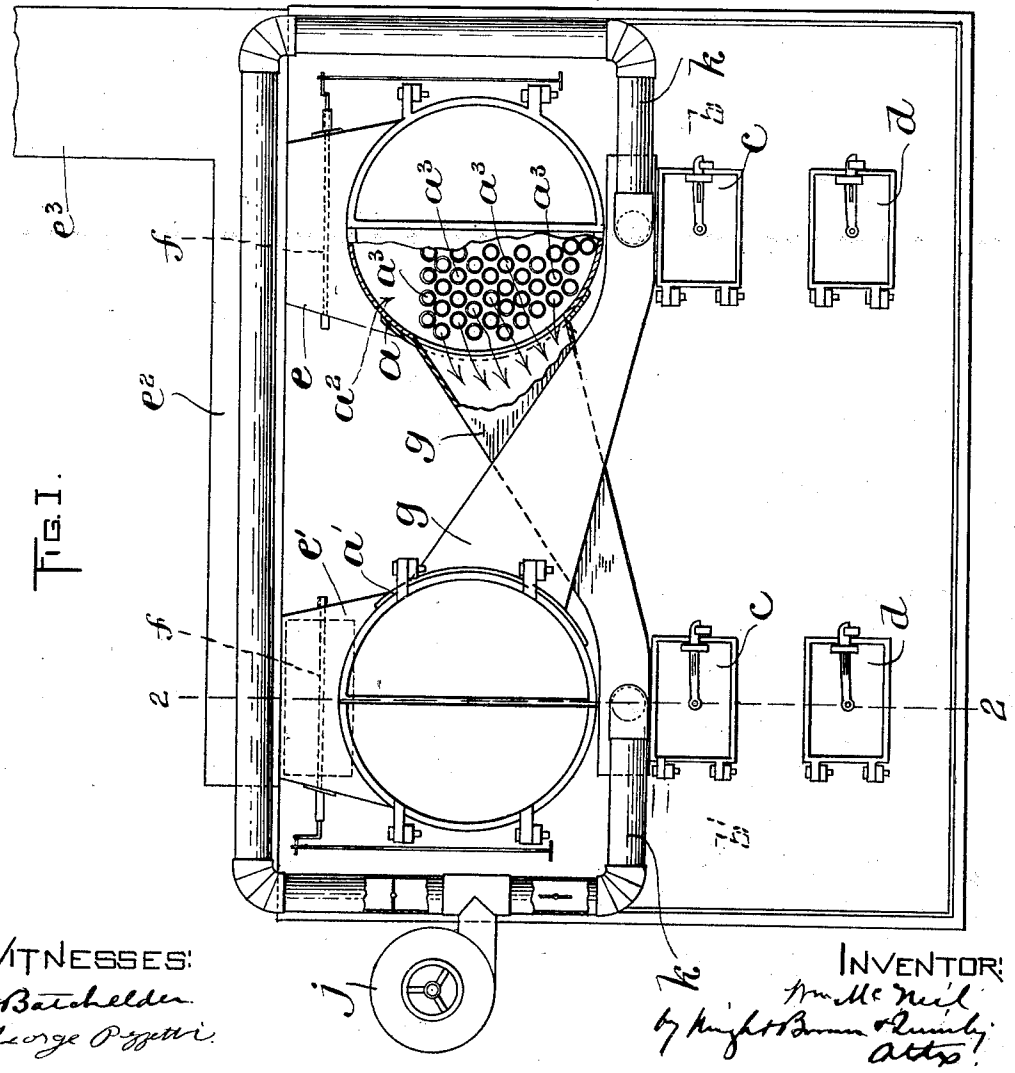


Fig. 1.



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UNITED STATES PATENT OFFICE.

WILLIAM McNEIL, OF BOSTON, MASSACHUSETTS.

SMOKE-CONSUMING ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 703,149, dated June 24, 1902.

Application filed July 27, 1901. Serial No. 69,928. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM McNEIL, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Smoke-Consuming Attachments, of which the following is a specification.

This invention relates to steam-boilers which have longitudinal tubes or flues extending longitudinally through the water-space of the boiler and conducting the products of combustion through said water-space from one end of the boiler to the smoke-chamber at the opposite end, the said smoke-chamber being connected by a suitable uptake with a stack or chimney, to which the products of combustion pass from the smoke-chamber, the boilers being assembled in batteries of two or more, each boiler having its own fire-box or furnace.

The invention has for its object to enable each smoke-chamber to be temporarily disconnected from direct connection with the stack or chimney and temporarily connected directly with the fire-box of an adjacent boiler, so that when fresh fuel is added to the fire under one boiler the unconsumed products of combustion entering the smoke-chamber of that boiler may be diverted to the fire-box of an adjacent boiler in which the fuel is well ignited or is in an incandescent condition, the said unconsumed products being consumed in the last-mentioned fire-box, so that the discharge of smoke through the stack and the waste of fuel is prevented or minimized.

The invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a front elevation of a battery of boilers embodying my invention. Fig. 2 represents a section on line 2 2 of Fig. 1.

The same reference characters indicate the same parts in both the figures.

In the drawings, a a' represent two tubular boilers, under or in suitable operative relation to which are fire-boxes b b'. c c represent the fire-doors of the said fire-boxes, and d d represent the ash-pit doors. Each boiler has a series of tubes or flues a^3, extending from end to end of the boiler through the water-space thereof, the said flues receiving the products of combustion from the fire-box and conducting the said products through the water-space to the usual smoke-chamber a^2, which is here shown as located at the front end of the boiler. e e' represent the uptakes, which conduct the products of combustion to a trunk or flue e^2, communicating with the stack or chimney e^3, each uptake having a damper f, by which it may be closed.

The construction thus far described is common and well known.

In carrying out my invention I provide each smoke-chamber a^2 with an independent conduit g, extending from the said chamber below the damper of its uptake to the fire-box of an adjacent boiler, the said conduits g preferably entering the fire-boxes just above the fire-doors, although they may enter at any other suitable points. The conduits g, in connection with the dampered uptakes, permit the fires to be managed and the products of combustion disposed of, as will next be described.

Assuming that the fire-boxes have been coaled at different times and that the fire-box b requires additional fuel, while the fuel in the fire-box b' has been well ignited, so that the products of combustion given off contain little or no carbon or smoke, coal is now inserted in the fire-box b and the uptake e is closed, the damper in the uptake e' being left open. The products of combustion entering the smoke-chamber of the boiler a' therefore pass directly to the stack through the uptake e', while the smoke-laden products of combustion entering the smoke-chamber of the boiler a pass through the conduit g, leading therefrom to the fire-box b', where the carbon and combustible gases are consumed. When the fuel in the fire-box b is well ignited, so that little or no smoke is emitted therefrom, the damper in the uptake e may be opened. When it becomes necessary to recoal the fire-box b', the damper in the uptake e' is closed, the damper in the uptake e remaining open, so that the smoke from the fresh fuel in the fire-box b' passes through the conduit g, leading to the fire-box b. It will be seen, therefore, that the series of fires may be conveniently managed, so that

there will be no objectionable emission of smoke at any time and no considerable waste of unconsumed gases, &c.

It is obvious that the described improvement may be applied to a battery containing any desired number of boilers and fire-boxes.

I find that by making the conduits *g* independent of the uptakes, each conduit leading from one smoke-chamber at a point below the damper of the uptake, so that each conduit is independent, I am enabled to utilize the draft in each fire-box to draw the products of combustion from an adjacent smoke-chamber through the connecting conduit *g*.

As the natural draft of the stack or chimney is not always sufficient to draw the products of combustion through the conduits *g* with the desired force, means are employed for inducing a draft in said conduits. I have here shown as such means a blower *j*, connected by air-pipes *k k* with the delivering ends of the conduits *g g*. Any other suitable means may be employed for this purpose. It will be seen that the air thus introduced into each fire-box with the products of combustion facilitates the fuel consumption of said products.

I claim—

1. The combination with a plurality of independent tubular boilers, and fire-boxes operatively related thereto, each boiler having a smoke-chamber at its forward end to receive the products of combustion after their passage through the boiler-tubes, each smoke-chamber having an independent dampered uptake for the direct escape of the products of combustion to a stack or chimney, of a corresponding plurality of independent conduits, each leading from the smoke-chamber of one boiler below the damper of the uptake to the fire-box of an adjacent boiler above the grate of said fire-box, whereby when the uptake of any smoke-chamber is closed by its damper, the products of combustion received by such chamber are drawn through the conduit leading from that chamber to the fire-box of an adjacent boiler by the draft existing in the last-mentioned fire-box, and means for forcing air with said products of combustion into each fire-box.

2. In a smoke-consuming apparatus, the combination of a plurality of smoke-chambers, each communicating with boiler tubes or flues, each smoke-chamber having a dampered uptake for the direct escape of the products of combustion to a stack or chimney, a plurality of fire-boxes, a corresponding plurality of independent conduits, each leading from one smoke-chamber below the damper of the uptake to the space above the grate of the fire-box under an adjacent smoke-chamber, and means for introducing air to said conduits at the point of connection with the fire-boxes to facilitate the consumption of products of combustion passing from said conduits to the fire-boxes.

In testimony whereof I have affixed my signature in presence of two witnesses.

WILLIAM McNEIL.

Witnesses:
C. F. BROWN,
E. BATCHELDER.